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Number 6.

SEPTEMBER, 1903.

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# TEXTILE WORLD RECORD

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The Annual Official Directory of the Textile Industries for 1903 is now ready. Office Edition, $2.50. Traveler's Edition, $2.00.

# THE TEXTILE-FINISHING MACHINERY COMPANY

**17 Exchange Place, Providence, R. I.**

INCORPORATED FOR THE MANUFACTURE OF

## BLEACHING, DYEING, DRYING AND FINISHING MACHINERY

CONTROLLING THE PLANTS FORMERLY OPERATED BY

THE GRANGER FOUNDRY AND MACHINE CO., Providence, R. I.
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**For Full Line of Machinery, See Inside Back Cover Page**

# FOR TEXTILE FABRICS

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# DYEING
# DRYING AND
# FINISHING
# MACHINERY

Drying Machines with Copper and Tinned Steel Cylinders.

Continuous Steaming Machines (Patented).

Open Soaping Machines.

Color Kettles with Stirrers. Padding Machines.

Oil and Gas Singeing Machines. Long and Short Chain System of Warp Dyeing.

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Openers.

**CALENDERS** Hydraulic, Rolling and Embossing, with Paper, Cotton, Husk and Excelsior Combination Rolls (Patented).

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Tentering Machines for Ginghams, Plaids, Etc. Tentering Machines for Worsted and Woolen Goods. Tentering Machines for Lawns, Etc. and having Patent Vibratory Motion. The above with either pin, spring clamp, or patent automatic clamp chain.

**MERCERIZING MACHINES**
FOR YARN AND CLOTH.

**PATENT WINDING MACHINE**
(W. P. Simpson, Patentee).

For use in connection with Singeing Machines, Soaping Machines, Drying Machines, Etc.

## H. W. Butterworth & Sons Co. Philadelphia, Pa.

# COTTON MACHINERY

REVOLVING FLAT CARDS,
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DRAWING FRAMES,
FLY FRAMES,
SPEEDERS,
RING SPINNING FRAMES,
RING TWISTERS,
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REELS,
SLASHER WARPERS,
LEESE WARPERS,
CYLINDER SLASHERS,
HOT-AIR SLASHERS,
FILLING WINDERS,
REGULAR LOOMS,
DUCK LOOMS,
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BALLING MACHINES,
FOLDERS,
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SEWING MACHINES,
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Complete Textile Equipment and Plans for Cotton Mills.

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**JOHN HILL, Southern Representative, Prudential Bldg., ATLANTA, GA.**

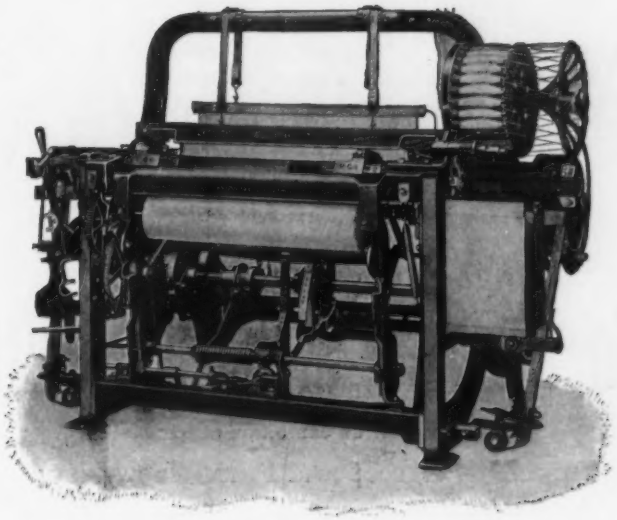
ALSO BUILDERS OF

## AMERICAN WORSTED MACHINERY.

SPINNING FRAMES with caps, rings or flyers and any kind of spindles for long or short wool, and any gauge of rollers.
DANDY ROVERS and REDUCERS with all latest improvements.
WEIGH BOXES and DRAWING BOXES with any kind of rollers and any number of spindles.
GILL-BOXES for drawing, fitted with cans or spindles.
GILL-BOXES for preparing before combing, and finishing afterwards.
MODIFICATIONS will be made of the above machinery to suit different kinds of work.
REPAIRS for the foregoing furnished upon short notice.

# WORSTED MACHINERY

ILLUSTRATED CATALOGUES SENT ON APPLICATION.



## Our Latest

# NORTHROP LOOM

ALTHOUGH our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

## THE DRAPER COMPANY,

HOPEDALE, MASS.

We beg to inform the trade that our

# Automatic Shuttle and Loom Attachment

is now on exhibition at our

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Where it can be seen in operation on Cotton, Silk and Worsted Looms of different makes. An inspection of these looms will convince every manufacturer of the following

**GREAT ADVANTAGES:**

1. Our device can be put on any modern Cotton, Silk or Worsted Loom.
2. Our shuttles change on the pick while the loom is running at regular speed and absolutely *leave no broken picks.*
3. It *does not affect the speed* of the loom at any time.
4. Our attachment is so *very simple* that it needs no more care than an ordinary loom and there is *no intricate mechanism* in our attachment which is liable to come out of order.
5. A weaver can attend, without extra exertion, to a *greater number of looms* with our device than with an ordinary loom.
6. It thus enables the weaver to earn *more wages.*
7. It is *time saving* and gives an *increase in the production* which is very considerable.
8. It reduces the manufacturing expenses *to a large extent.*
9. *Waste* on the quills is *reduced* to almost nothing.
10. As the loom stops less frequently, its operation is more regular, consequently producing *better* goods and also keeping the *looms in better condition.*

The superiority of our Automatic Shuttle and Loom Attachment over all existing similar devices is its simplicity and the fact that it absolutely leaves no mispicks whatsoever, which has been a cause of surprise and admiration to all experts who have seen our Attachment in operation.

**We Guarantee Our Automatic Shuttle and Loom Attachment to Do Exactly What We Mention Above.**

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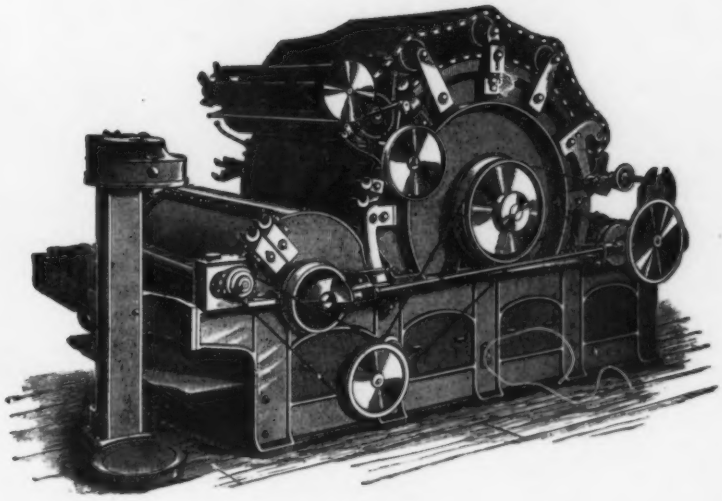
**TAUNTON, MASS.**

# Cotton Machinery



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Drawing Frames, Spinning
Frames, Mules and
Looms,

INCLUDING

## Plain and Fancy Silk Looms

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THE

# WHITIN MACHINE WORKS,

# Cotton Machinery

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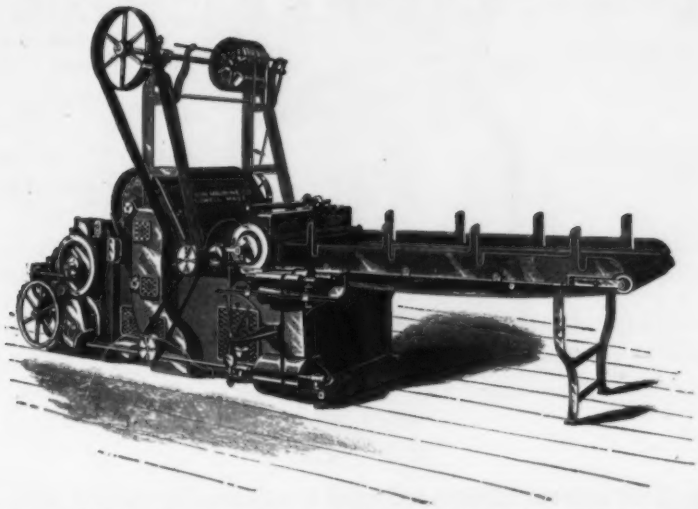
**and Equitable Bldg, ATLANTA, GA.**

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

# The Best Pickers

**In the Cotton Field nothing equals the DARKY COTTON PICKERS.**



**In the Cotton Mill nothing equals the KITSON COTTON PICKERS.**

## KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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**BUILDERS OF**

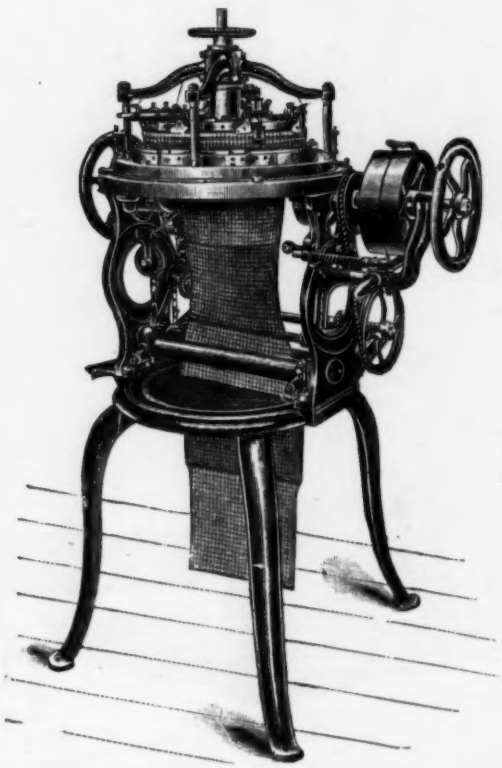
## RIB KNITTING MACHINERY

**FOR UNDERWEAR AND HOSIERY**

The illustration shows our

**Improved High Speed Single Lever Automatic Ribbed Underwear Machine**

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever, or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to twelve, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened, or with patent inserted walls for fine fabric.

Special Machinery for Sweaters, etc.

**We build Loopers, Ribbers and other Machinery for Knitting Mills.**

——AS WELL AS——

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Hand or Power, Open Top or Hold Down.
**KNITTERS**

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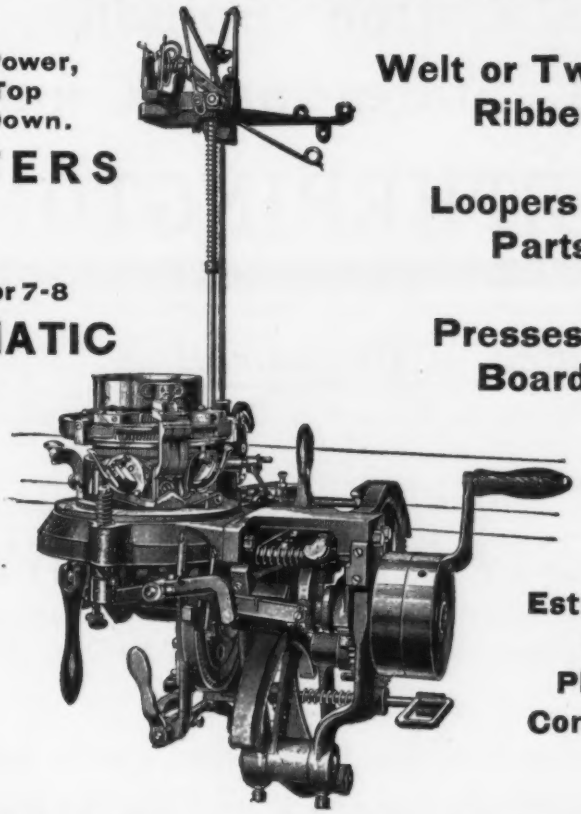
**AUTOMATIC KNIT-TERS**

All Sizes and All Gauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

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Estimates for Plants Complete.

Winders and Bobbins. Hand Forged Steel Cylinders.

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## of the Cotton Spindles in the United States and Canada are

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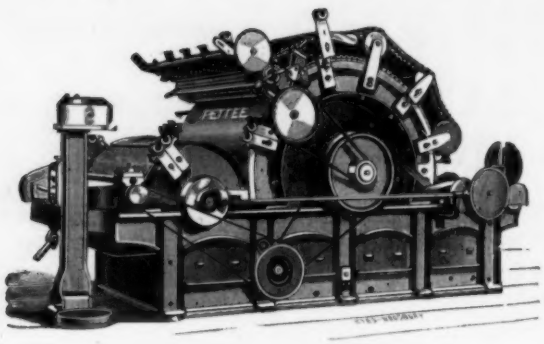


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REVOLVING FLAT CARDS,
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Patent Conical and Parallel

## Drum Winders

Any traverse from 2 1-2 in. up to 10 in. ARRANGED WITH STOP MOTIONS UP TO SIX ENDS. For first cost, production, quality of work, and cost of winding, it has no equal.

## OUR NEW WINDER

12 spindles to a machine any traverse from 2 in. up to 8 in. builds both cones and parallel tubes either the close or open wind, single or many ply from cops, bobbins, or skeins. Production and quality unsurpassed. Samples, prices and full particulars furnished on application.

**Machines Carried in Stock for Immediate Delivery.**

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New and Improved Looms,

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# "HURRICANE"
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For WOOL,
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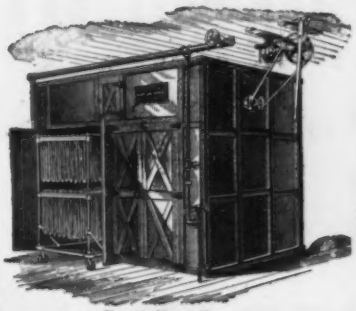

Truck Yarn Dryer.

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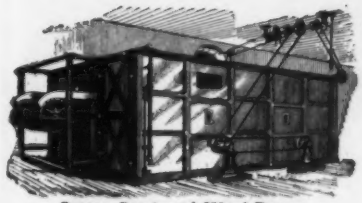
"Hurricane" Fan, Style No. 2.



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**Outfits for Wool**
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Not much need to dwell upon the advantages of the automatic system, by which uniform results are obtained with saving of oil and labor, as compared with the sloppy, guess work, waterpot system.

It's the story of the Bramwell and Apperly feeders over again. How many mills are feeding by hand to-day? There will be very few oiling by hand in a few years. Hundreds of the best mills are using the Spencer Oiler to-day. Are you? If not, send for particulars.

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PLAIN AND FANCY

LOOMS

For Silk or Cotton; Automatic Filling Changing Mechanisms,

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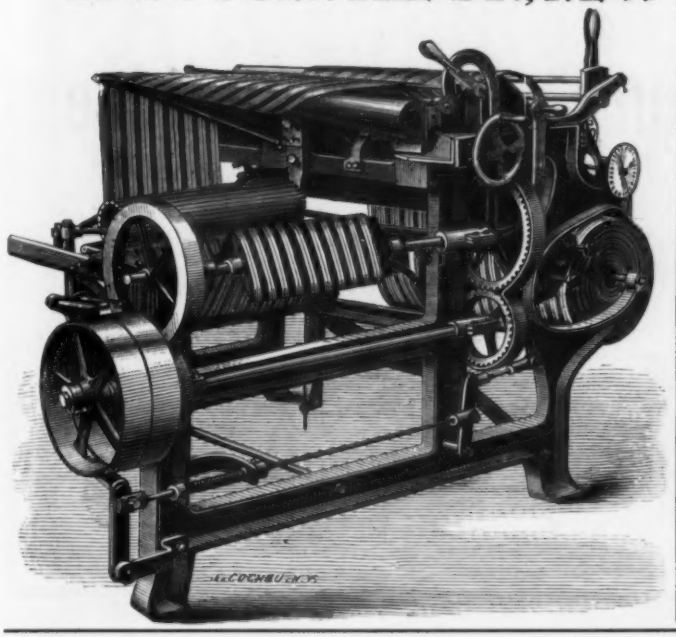
**82 & 84 CENTRE ST., NEW YORK, U.S.A.**



## Machines to Print Trademarks

On Cottons, Woolens and Carpets.

## Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

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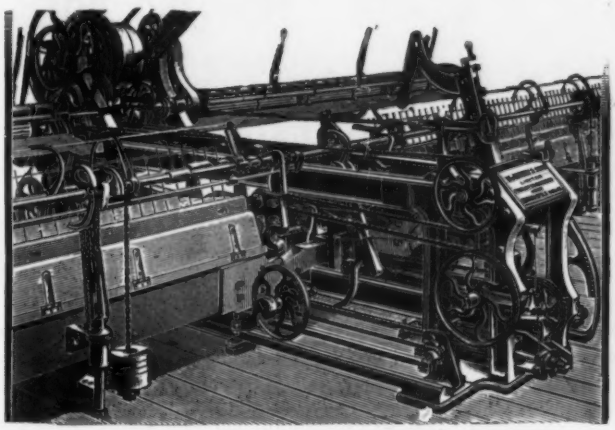

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**Makers of all descriptions of**

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# AMERICAN DRYING MACHINERY CO.

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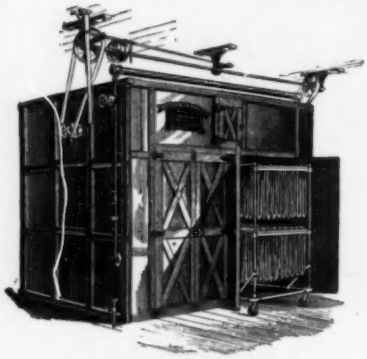
FOR WOOL, COTTON, STOCK, YARNS, HOSIERY AND UNDERWEAR.



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Carbonizing Plants Complete;
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It is guaranteed to save you half the cost of your lubricating oil.

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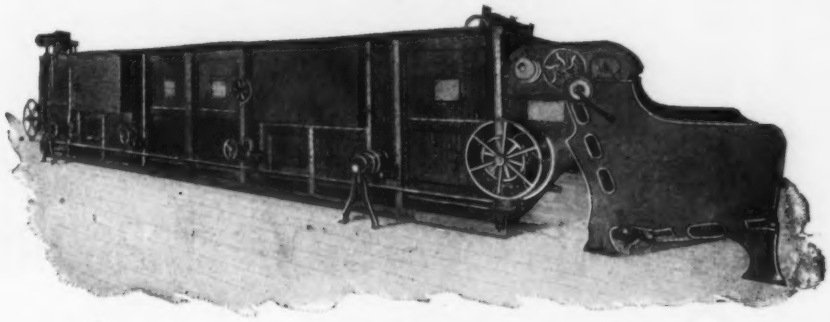

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**Latest Improved High Speed Automatic Clamp and Pin Tentering Machines, Jig or Straight, any length and width.**

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Opening and Folding Machines
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Sewing Machines
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Crabbing Machines
Continuous Wet Finishing Machines
Continuous Steam Finishing Machines
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Steam Finishing Machines,
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**FOR FOUR, SIX OR EIGHT STRINGS OF GOODS**

**BEST QUALITY SOLID ROLLS.**

Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

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*BUILDERS OF WOOLEN MACHINERY*

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**WATER WHEELS,**
Horizontal and Vertical.
Iron Flumes.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
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Combined Fulling Mill
and Washer for Knit Goods.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
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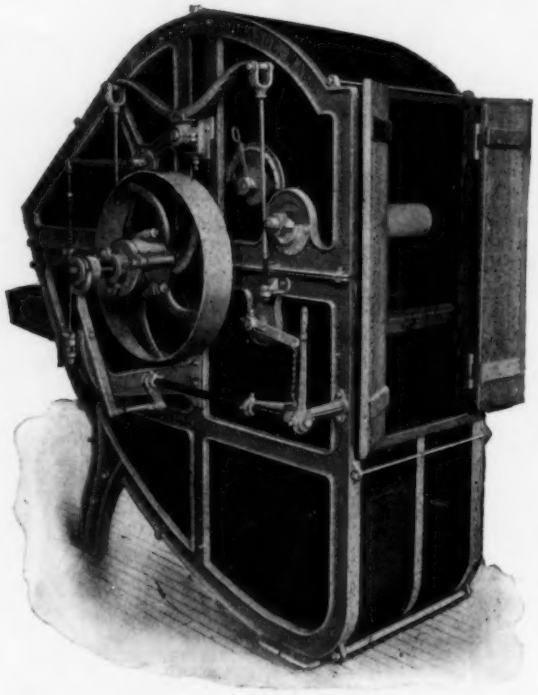
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines.
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

## New Rotary Fulling Mill



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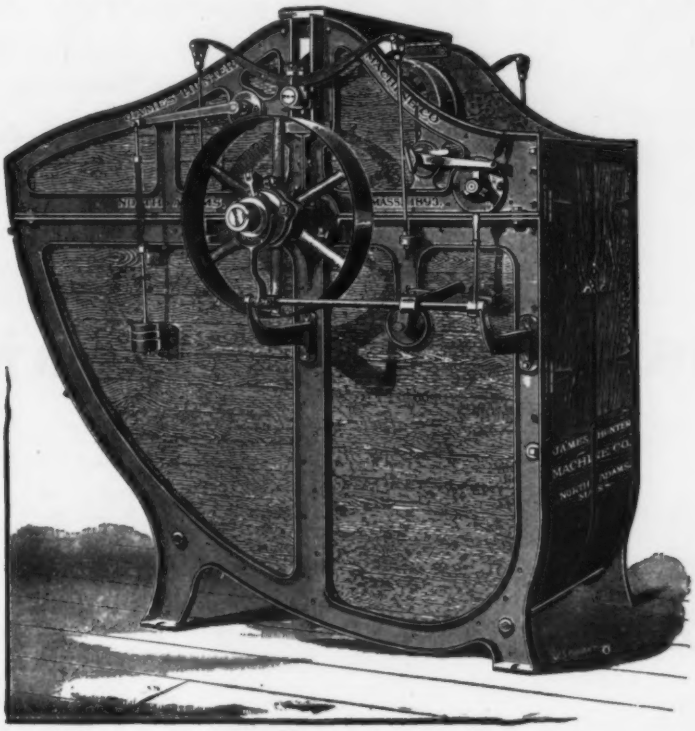
# Automatic Wool Washers

PARALLEL RAKE

*The* "STONE DRYER," for Wool, Cotton, Rags, Etc.
CARBONIZING MACHINERY, ETC.

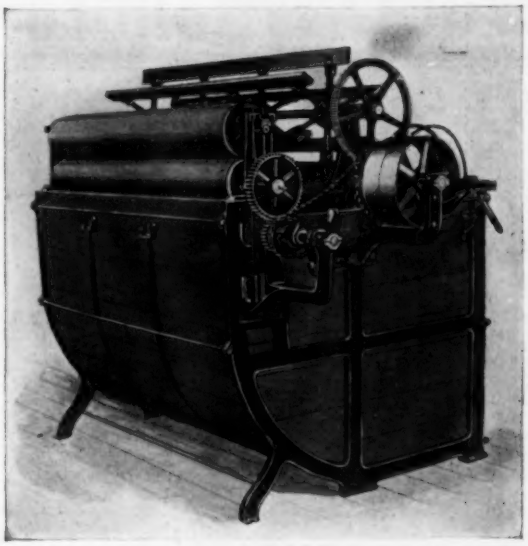


Fulling Mills, Cloth Washers,
WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.

YOU WANT THE BEST. WE BUILD THEM.

## CLOTH WASHERS



1903 PIECE DYEING MACHINE.

## FULLING MILLS

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

# HOPKINS MACHINE WORKS

PROVIDENCE AND BRIDGETON, R.I.

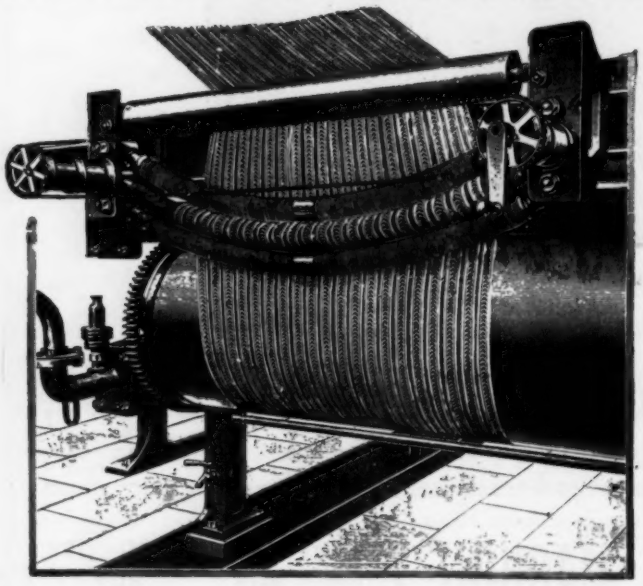
PROVIDENCE OFFICE

49 Westminster Street.

Our machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our fulling mill for extra heavy goods and blankets.

# A PERFECT CLOTH EXPANDER



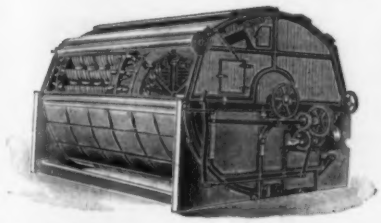
The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

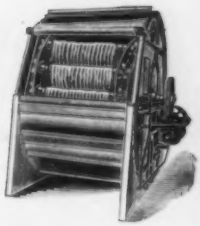
Sole Agents for the United States and Canada.

SKEIN AND SLUBBING MACHINES.



**SAVES**
**75 per cent in Labor,**
**30 per cent in Winding,**
**Steam and Dye Stuffs,**
**Perfectly Even Dyeing.**

**CAPACITY:**
**50 to 700 pounds per batch.**



No Friction on the Skeins. No Tangling of the Yarn.

Universally Used.

J. H. A. KLAUDER, Pres. and Gen'l Manager. J. H. GILES, Treasurer.
E. HEPPENSTALL, Huddersfield, Eng.

# THE KLAUDER-WELDON
# DYEING MACHINE CO.,
## AMSTERDAM, N. Y.

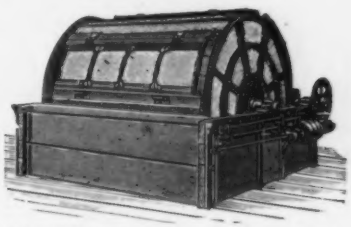
BUILDERS OF MACHINERY FOR DYEING, BLEACHING AND MERCERIZING.

For Skein — Worsted, Slubbing, Cotton and Silk.
" Raw Stock — Cotton, Wool, Waste and Slubbing.
" Garments — Underwear, Hosiery, Hats and Caps.
" Sulphur Colors — Skein, Raw Stock and Hosiery.
" Skein and Warp Mercerizing.

RAW WOOL AND COTTON MACHINES.

**SAVES**
**50 per cent in Labor,**
**besides Steam and Dye Stuffs.**
**Practically Indestructible.**

**CAPACITY:**
**200 to 1000 lbs. per batch.**



Leaves Stock in Perfect Condition. Does Not Mat or Tangle the Fibre.

A Perfect Machine.

# OSWALD LEVER

Formerly LEVER & GRUNDY

## Builders of Textile Machinery

***FILLING COP WINDING MACHINES.*** Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to finest numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines can be arranged to wind cops or butts from the largest used in weaving to the smallest cops or butts for cotton filling used in the silk trade.

OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

***BANDLESS SPINDLE SPOOLING MACHINES;*** adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES; BRASS BOBBIN WINDING, SPOOLING, WARPING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, etc., etc.

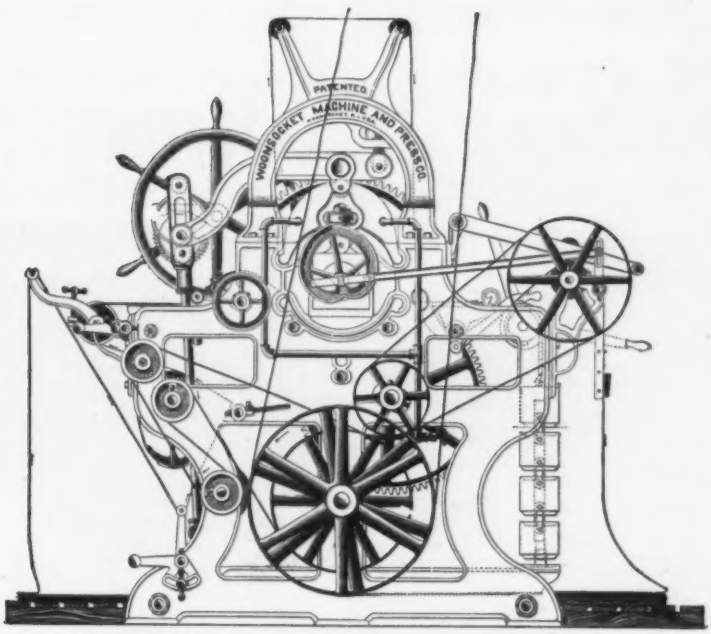
## Lehigh Ave. & Mascher St., Phila., Pa.

# Best Patent Steam Rotary Cloth Press

## Four Separate Pressings In One Machine!

**The Only Press that has Self-Yielding Beds with Four Points of Contact**

**PERFECT TEMPERATURE, POWERFUL, SIMPLE**




THE WOONSOCKET ROTARY PRESS.

## Woonsocket Machine and Press Company

WOONSOCKET, R. I,

WM. FIRTH, Pres. EDWIN BARNES, Vice-Pres. JOHN H. NELSON, Treas.

# WILLIAM FIRTH CO.

67 Equitable Building, 150 Devonshire Street, BOSTON, MASS.

. . . SOLE IMPORTERS OF . . .

## ASA LEES & CO., Limited,

## TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

SOLE AGENTS FOR

**JOSEPH STUBBS,** Gassing, Winding and Reeling Machinery for Cotton, Worsted and Silk.

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**JAMES YATES & SON,** Hardened and Tempered Steel Card Clothing for Woolen and Worsted Cards.

**LOCKETT, CROSSLAND & CO.,** Engravers and Builders of Leather Embossing Machinery, etc., etc.

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**BRADFORD STEEL PIN CO.,** Comber Pins.

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**JOSEPH SYKES BROS.,** Hardened and Tempered Steel Card Clothing for Cotton.

**WILLIAM TATHAM & CO.,** Waste Machinery.

**DRONSFIELD BROS., Limited,** Emery Wheel Grinders, Emery Fillet and Flat Grinding Machines.

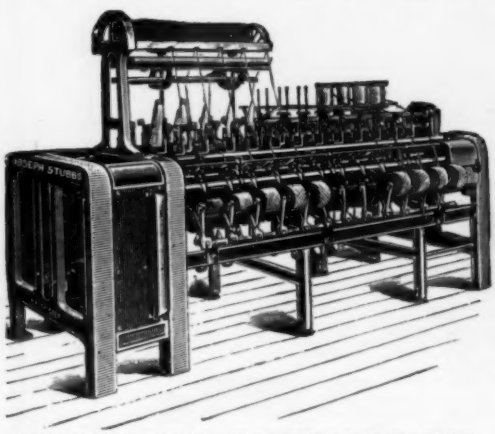
**COTTON CORD AND VELVET CUTTING MACHINE CO.,** Corduroy Cutting Machines, etc.

**PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.**

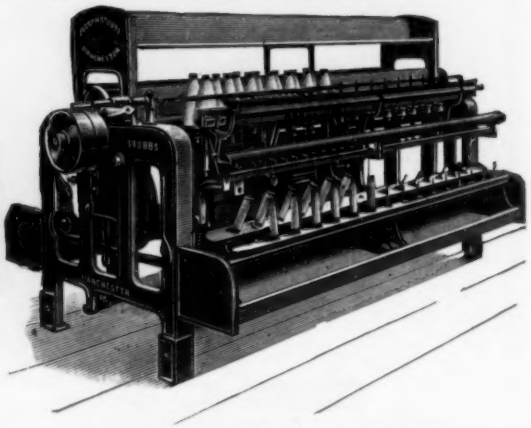
## JOSEPH STUBBS, . . Manchester, England,

# SPECIAL MACHINERY,

For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.




PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

Sole Agents for the United States and Canada:

*WILLIAM FIRTH COMPANY, 67 Equitable Buildings, 150 Devonshire Street, BOSTON, MASS.*

# Pulley and Gear Forcer.

We build a **simple,** powerful and very effective machine to remove gears and pulleys from shafting. Many mills use them. **Only costs $8.00.** Saves its cost in time and breakage.

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# AMERICAN MOISTENING COMPANY

**Equitable Bldg., Boston, Mass.**

Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

**"Simplicity and Originality of Design."**

Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

## The Only Perfect System of Air Moistening

**And Has Been Adopted by the Representative Manufacturers of this Country.**

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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FOR COTTON, AND GINGHAM MILLS, BLEACHERIES, PRINT WORKS, ETC.

MANUFACTURED BY

ELLIOT & HALL, 41-2 Hermon St., Worcester, Mass

Send for Circular.

**SILK MILL SUPPLIES**

OF EVERY KIND AND DESCRIPTION

Also Power Transmission Supplies for General Mill Use.

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Deliveries always on Time

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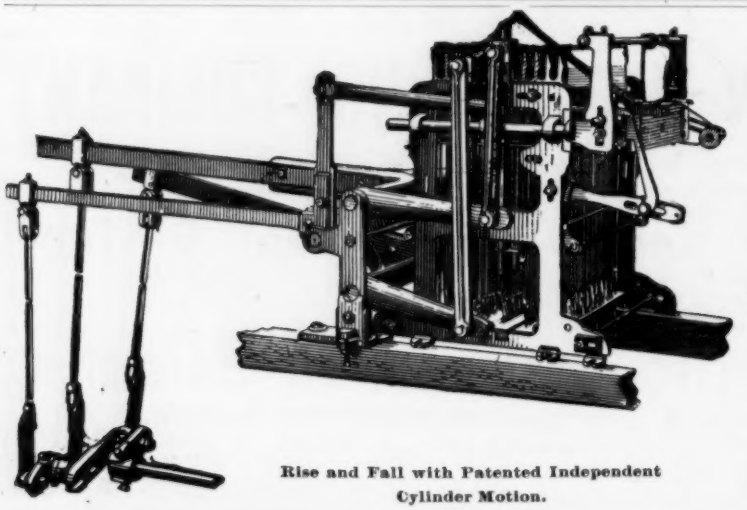

Rise and Fall with Patented Independent Cylinder Motion.

USE THE

**HALTON JACQUARD**

**"The Best Machine on the Market"**

**Original Fine Index Machines**

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

**THOMAS HALTON'S SONS,**

Allegheny Avenue and C Streets,

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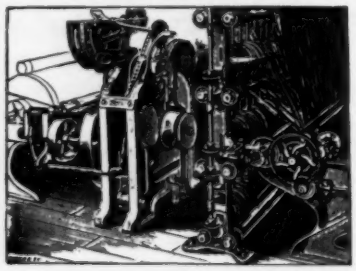


**TORRANCE MFG. CO.,**

HARRISON, N. J.

TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

**CHOQUETTE WASTE SAVER.** Saves card fly.

Write for particulars.

**CURTIS & MARBLE MACHINE CO.**

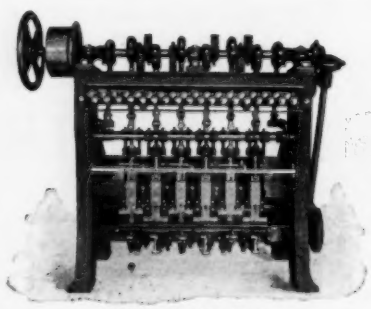
MANUFACTURERS OF

Wool Burring, Picking and Mixing Machinery

**Cloth Finishing Machinery**

For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

72 Cambridge St., near Webster Sq. **WORCESTER, MASS.**



70-Needle Machine.

**L. F. FALES,**

*Manufacturer and Builder of*

**Multiple Needle Sewing Machines,**

For Sewing Carpet Lining, Horse Blankets, Wadding, etc.

These machines can be built with any required number of needles.

SPECIAL MACHINERY DESIGNED AND BUILT.

Telephone Connection. **WALPOLE, MASS.**

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# Metallic Rolls

**Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.**

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## Patent Warping, Balling, Beaming and Long Chain Dyeing

## MACHINERY

And All Kinds of Expansion Combs, for Warpers, Beamers, and Slashers.

**ALSO TRAVERSE WHEEL AND ROLL GRINDERS**
for American or English Cotton, Woolen or Worsted Cards.

Particular attention given to the Repairing of Grinders of all makes for Cotton Woolen or Worsted Cards.

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## Mill Sewing Machines

Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

**Send for new circular telling how to get perfect work in this department.**

**BLEACHING, DYEING and FINISHING MACHINERY.**

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ESTABLISHED 1834. E. A. BURNHAM, Propr.

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PAWTUCKET, ... R. I.

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## Cloth Stretchers

Thread and Yarn Reels
Improved Thread Dressers

Yarn Printing Machines for Warp or Skein, Belt Cutters, Scarfing Machines.

## R. H. HOOD,

**Successor to THOMAS RAMSDEN,**

Maker of

## Worsted Machinery,

**For Preparing, Finishing Gills and Drawing Boxes**

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

**1213-15 Day St. or 1420-26 Callowhill St., PHILA.**

## C. L. BROWNELL,

BUILDER OF

## IMPROVED SPINNING

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## TWISTING MACHINERY

**FOR HARD OR SOFT TWINES, LINES, CORDAGE, ETC.**

**Of Sisal, Manila, Cotton. Linen, Hemp, Jute, Silk, Hair, Paper, or Wire.**

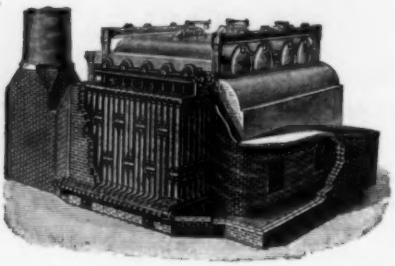
Write for particulars in regard to our new machine for spinning heavy Cotton Yarn direct from Drawing Sliver for Cotton Rope, etc.

***49 and 51 Union St., Worcester, Mass.***

## In Supplying Boilers with Hot, Purified Water,

Thus keeping a larger heating surface, as well as meeting sudden demands for power, the

# Green's Economizer



**Is but beginning its Savings to Plant Owners.**

What has been, and possibly will again be, cost of fuel—one of the greatest expenses of a plant, is reduced from 10 to 20%. Mills, Bleacheries and Dye Works having a *Green's Economizer* realize the greatest saving. We will be pleased to send our free booklet showing construction and how applied.

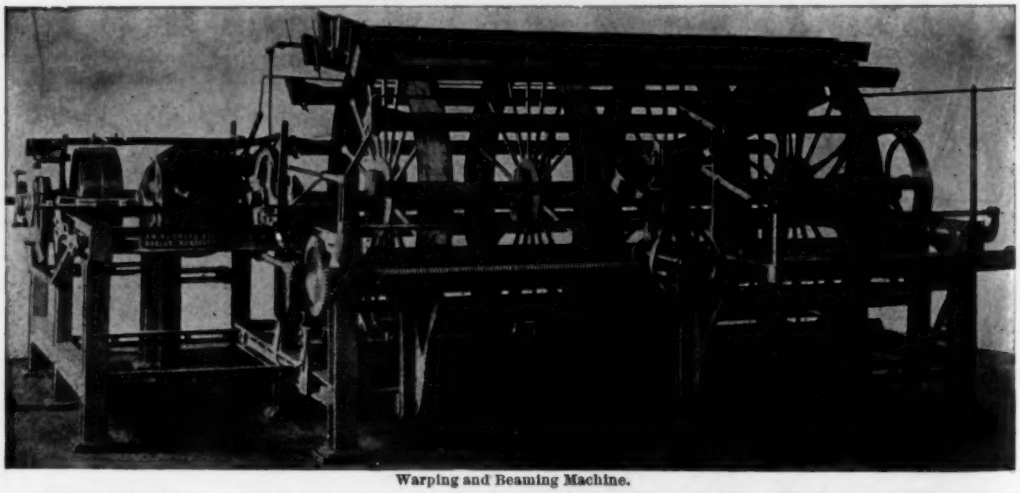
## The Green Fuel Economizer Co.,

**Sole Manufacturers in the U. S. A.** **MATTEAWAN, N. Y.**

## J. W. KNOWLES & CO., Globe Works MANNINGHAM, Bradford, England.

Established 1864. IRON AND BRASS FOUNDERS, GENERAL MACHINE MAKERS AND MILLWRIGHTS,

Telephone, No. 2132 Bradford. Telegrams, "Machines, Bradford." W. U. T. Code used.



Warping and Beaming Machine.

**SPECIALTIES:** Dyeing and Finishing Machinery. Tentering and Drying Machines. Wet Finishing Machines. Mangles. Calenders. Warp and Hank Dyeing Machines. Hank, Warp and Piece Mercerizing and Lustring Machinery. Yarn Finishing Machinery. Patent Sectional Warping and Beaming Machine.

Estimates and Plans prepared for complete Piece or Warp Bleaching, Dyeing and Finishing Works.

SEVERAL YEARS AGO a clever business manager said to us, "I think I can make a satisfactory settlement from our inventory."

Several years ago Captain Webb, the noted swimmer, said, "I think I can rely upon my own skill in swimming to carry me across the whirlpool rapids at Niagara."

They both made their experiments. Webb lost his life; the manager lost most of his fortune. Their experiences, if heeded, are profitable to all men, but valueless to the victims.

Have our appraisal and have it now.

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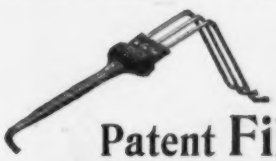
R. H. CLEGG, Prest. C. R. PADELFORD, Treas.

THE CLEGG WEFT FORK CO.



Manufacturers of the

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Patent Filling Fork

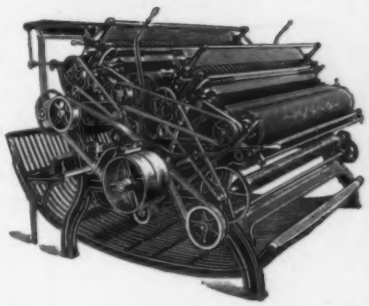
AND DOBBY SPRINGS

Solid Socket, Can't Work Loose. Best of Steel Wire, Well Balanced. Wires Cannot Work Loose or Come Out. Send for sample.

Office: 85 North Main Street, FALL RIVER, MASS.

FINISHING MACHINES Shears for Cloth, Carpets, Rugs, Plush with sets of Shears for one or both sides; Lapping, Folding, Rolling, Measuring Machine. The two and three-roll machines make solid roll holding length and finish. Baling and finishing Presses. HOWARD FOUNDRY & MACHINE WORKS, LANSDOWNE, Delaware County, Pa.

DOUBLE SHEAR



The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

Parks & Woolson Machine Co. Springfield, Vermont.

DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

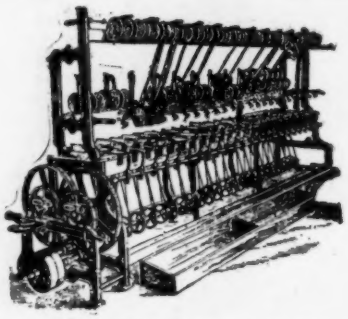
It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

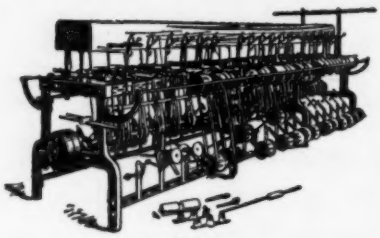
DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

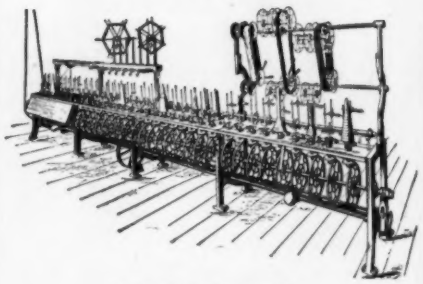
# SPOOLING, WINDING, WARPING & BEAMING MACHINERY



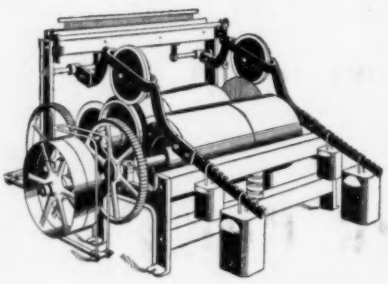
Shuttle Bobbin Winder with Variable Motion.



Cop Winder.



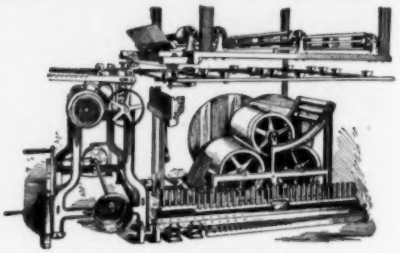
Hosiery Bobbin Winder.



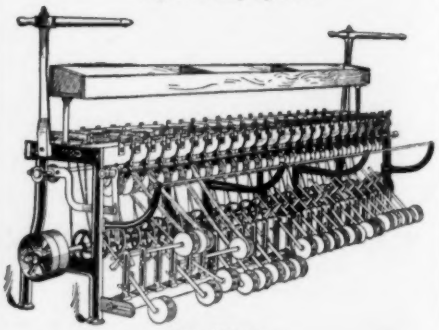
Compress Beamer.

JACOB K. ALTEMUS, 2818 NORTH 4th ST., PHILADELPHIA, PA.

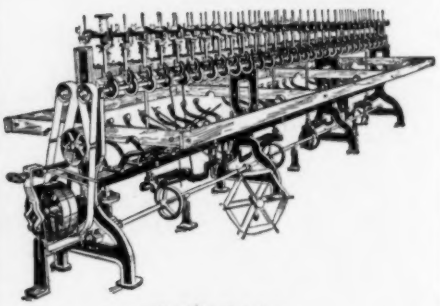
FULL PARTICULARS ON APPLICATION.



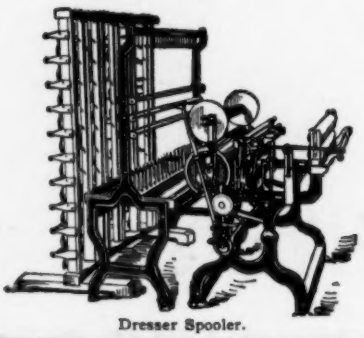
12 Space Warp Splitter.



Butt Winder.



Upright Spooler.



Dresser Spooler.

## THE BEST SYSTEM IN THE WORLD FOR WINDING FIBRE AND WIRE.

NO KINKING.
NO WASTE.
NO VARIATION IN TENSION WHILE UNWINDING.
NO REWINDING REQUIRED.

# "UNIVERSAL"

## The Best Winding Machine in the World.

*High Speed, Great Durability, Interchangeable Parts, Perfect Tension, Easy to Operate.*

## UNIVERSAL WINDING COMPANY

95 SOUTH STREET, BOSTON.

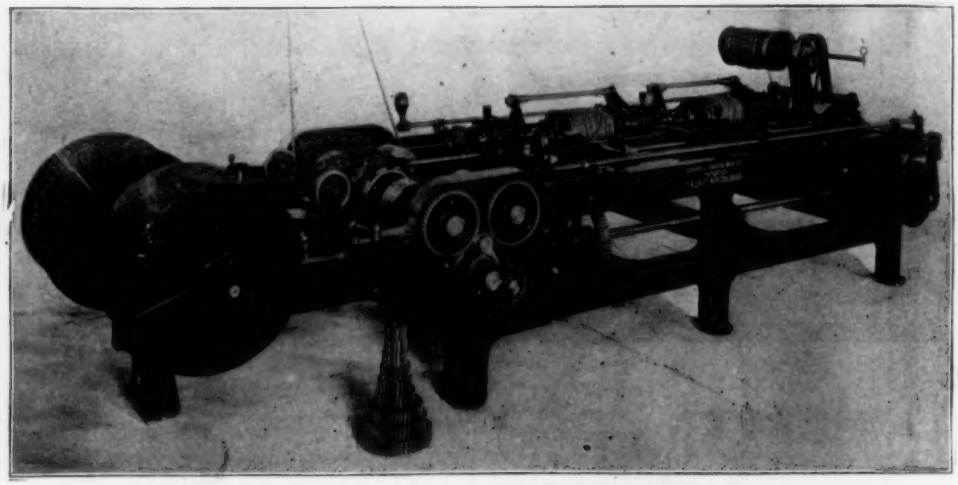
## THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

# Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

## COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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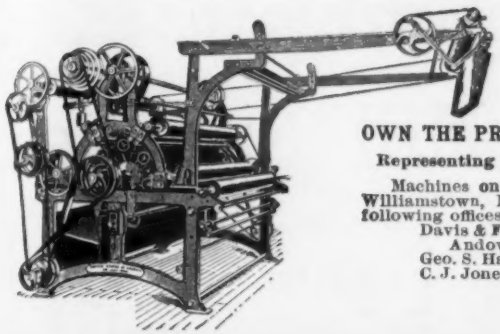
AND ALL BRAIDED FABRICS.



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**OWN THE PRINCIPAL PATENTS ON NAPPING MACHINES.**

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Machines on Exhibition and Samples Napped at North Andover and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

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Geo. S. Harwood & Son, 53 State Street, Boston.
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Established 1870

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for WOOLENS, WORSTEDS, FELTS, etc.

*Built Upright or Horizontal with Low Down Feed*

*Ventilating Fans a Specialty*

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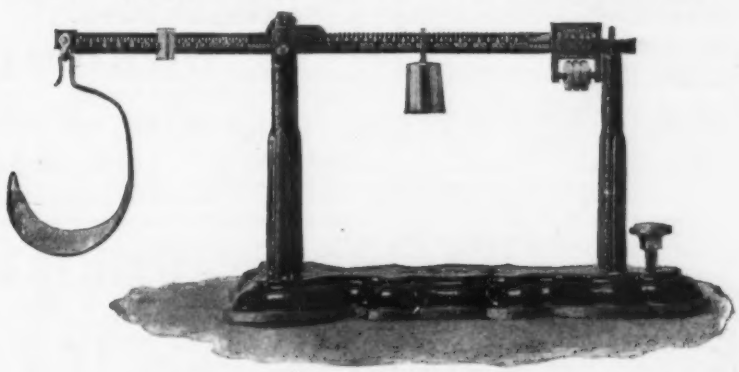
That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



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☞We make scales of every description.

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Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

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# in Mill Supplies.

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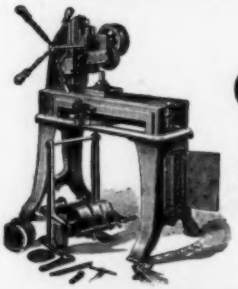
We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.



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Especially adapted for use in Repair Shops. Now in use in **Three Hundred** representative mills, including **Twenty-Four** in Fall River, Mass. On application, we shall be glad to submit full particulars, prices and photographs of the latest improvements. Send for **Gear Cutter Pamphlet.**

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**SPINNING RINGS.**
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The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

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For PLAIN and FANCY WEAVING.

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Krams Ave., formerly Church St., Manayunk, Phila., Pa.

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Special Machinery Built General Machinery Repairs
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**MAILS.**

Liberal Discount to Dealers.

**J. WALDER, Paterson, N. J.**

*REEDS, HARNESSES, LINGOES, SHUTTLES AND QUILLS.*

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**WATSON'S** HEDDLE FRAMES. WIRE HEDDLES. TEMPERED STEEL WIRE STRIPPER CARDS.

ADDRESS L. S. WATSON MFG. CO., LEICESTER, MASS. FOR THE VERY BEST MADE

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**Shaw's "Victor" Travelers**

Manufactured by

**VICTOR SHAW RING TRAVELER CO.**

Incorporated 1899.

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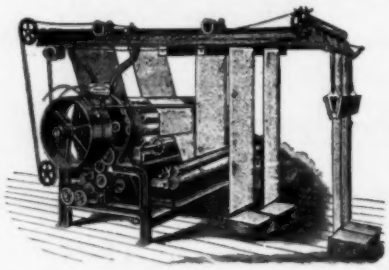
# ECLIPSE NAPPING MACHINE.

**Fabric in Direct Contact with the Napping Rollers all around the Drum.**

Greater Production. Better Finish. Easier Threaded. No Shifting of Filling. Better results than can be obtained with teasels.



Long or short nap as desired on cotton or woolen goods, from the lightest to the heaviest.

No heavier napping on the sides than in the centre.

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**Eight Thousand Sets in Operation in This Country and Europe.**

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:

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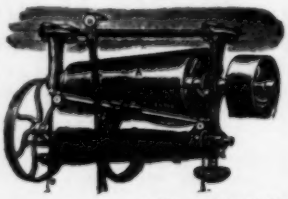

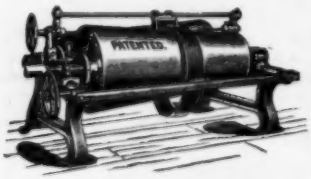


Smith & Winchester Co., So. Windham, Conn., 280 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Sacco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

Send to G. FRANK EVANS, 85 Water Street, Boston, Mass., for Illustrated Catalogue.

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ROVING CANS.

TRUCKS and BOXES.

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WOONSOCKET, R. I.

## Napping, Shearing and other Machinery

For Finishing Woolen, Worsted, Cotton, Knit Goods, Blankets, etc.

**Greene Nappers.** **French Nappers.**

Shearing Machines a Specialty.

Special attention paid to Repairing all kinds of Shear Rests and to Repairing and Grinding of all kinds of Shear Blades.

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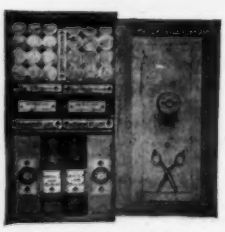
FIRE BRICK AND CLAY RETORTS

# Somebody Gets Hurt



Cut of No. 1

Nobody knows what to do or has anything to do with, until the doctor comes and every minute's delay counts against the injured.

## THE STANDARD ACCIDENT CABINETS

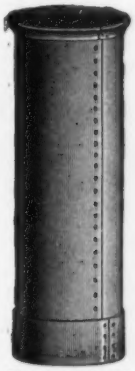
Are designed for just such emergencies.

**CONTENTS.**

| | | | |
|---|---|---|---|
| 6 rolls linten bandages | 2 in. | 2 packages absorbent lint. | |
| 6 " " " | 2 1-2 " | 2 " " cotton, 1-4 lb. | |
| 3 " cotton " | 1 1-2 " | 1 12 oz. bottle carron oil. | |
| 3 " " " | 2 " | 1 12 " " arnica. | |
| 3 " " " | 2 1-2 " | 1 roll adhesive plaster. | |
| 3 " " " | 3 " | 1 package iodoform gauze. | |
| 2 packages first aid for wounds. | | 1 pair scissors. | |
| 2 " linten gauze. | | | |

These Cabinets contain only the highest grades of medicines and bandages which are thoroughly sterilized and antiseptic. Send for Circular. Price No. 2, $10.00; No. 1, $7.00.

**PUTNAM & CO., 150 Nassau St., NEW YORK CITY.**



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MANUFACTURERS OF
ROVING CANS
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MILL RECEPTACLES.
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THE "SULLIVAN"
Seamless Manilla
Fibre Roving
Can.

LAMINAR FIBRE COMPANY,
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HARD & FLEXIBLE FIBRE : : : :
for ELECTRICAL & MACHINISTS' PURPOSES, RAILROAD INSULATIONS, RODS, TUBES, Etc.
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Laminar Taper Box with hardwood shoes. Top View.

Laminar Car or Truck with Corners and Steel Top Rim.

Laminar Taper Box with hardwood shoes. Bottom View.

# Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of
HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

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# STEAM TRAPS

**NEW FEATURES: Wearing Parts, Valve and Seat Renewable.**

Class A Return Trap

We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or discharging to Hot Well, Tank or Atmosphere.

**No Elastic Gaskets, all Joints Ground Metal and Metal.**

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Manufacturers and Repairers of

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**Mill and Machine Brushes**
For Textile, Paper Mills, Etc.
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Portable and Electric.
Controls Night Watchman.
Allowance made for old clocks.
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Is a machine for the application of Paint, Shingle-stain or Whitewash by means of compressed air. By its use, two men can do the work of ten in the old way, and in some cases do it better. For every hour it is used Patton's Aereo Painter saves the cost of one man's labor for one day

## Patton's Asbestos Fire-Proof Paint

applied with the Aereo-Painter to inside work, in mills, factories and warehouses, will prevent fire from sparks and even resist light flames. Reduces insurance rates, and for inside work has all the good points of oil paint, but costs much less.

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Made of paper and wood,
Needs no covers,
Will not split
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Not liable to break.

BOX SHOOKS and CLOTH BOARDS.

MF'G. BY CHAFFEE BROTHERS COMPANY, OXFORD, MASS.

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Jack and Skein Spoolers, Quillers, Beamers, Yarn Splitters, Dye Machines, Balling Machine for Long-Chain Warpers, Allen Boiler Grate.

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# Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

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2124 to 2130 East York St., PHILADELPHIA, PA.

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Manufacturer and Importer. All Work Guaranteed.

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Hackles, Gills, Fallers and Porcupines. Tentering Tin Plates. Dealer in the best English and American Cast Steel Pins and Comber Needles.

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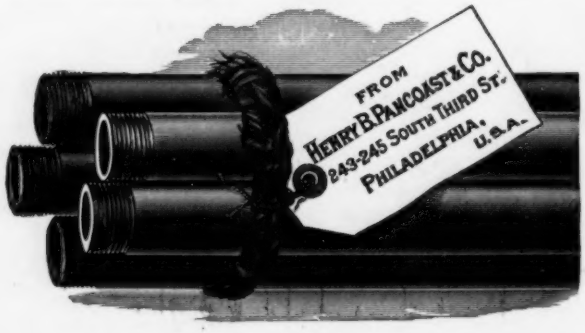


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for steam, water and gas.

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Iron and Brass Fittings, Valves, Etc.
Iron and Brass Railing and Awning Fittings. . .

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means dollars saved in every shop using as little as three barrels of oil a year.

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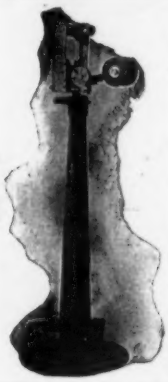

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Easily and quickly applied to fabrics of any weight.
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The machine does the whole thing.
It is cheap, serviceable and durable.

We also make a machine which

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**THOROUGHLY GUARANTEED.**

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**CONCRETE**
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Pat. Sept. 30, 1902.
Avoid scale waste.
Avoid soot waste.
Be progressive,
There is but one best.

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**For Cotton and Woolen Mills, for Marking Roving, Yarns and Cloths. Contains No Oil or Wax. Made in 15 Colors and White.**

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THEY CANNOT FAIL.

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Write for catalogue. Highest Award Pan-American Exposition.

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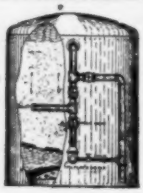

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**PRESSURE and CRAVITY FILTERS**
Any capacity and a liberal guarantee fully met. Address,
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Approved by the New England Board of Fire Underwriters.

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your factories, homes, churches and all combustible property.

AGENTS WANTED.

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Equal, if not Superior, to any in the market.

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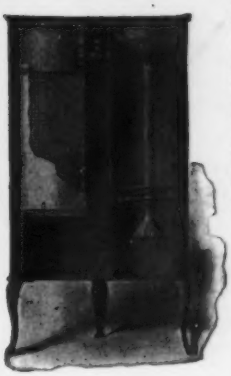

at par is rather a scarce article these days—Market value nearer two fifty—You would lay such an investment away very carefully.

Of all the economies that may be practised around every power plant, there's none that will show such quick returns as the refiltering of dirty lubricating oil.

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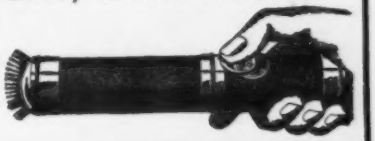

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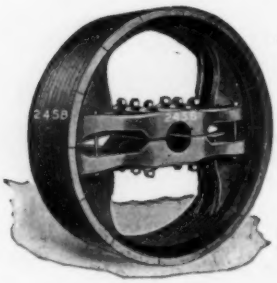

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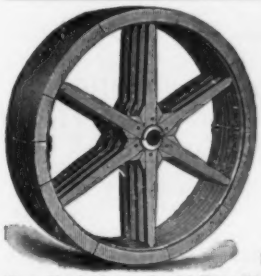

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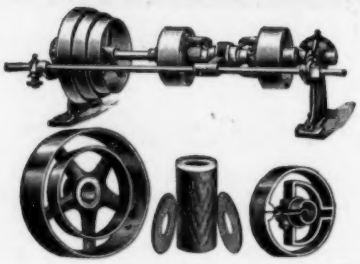

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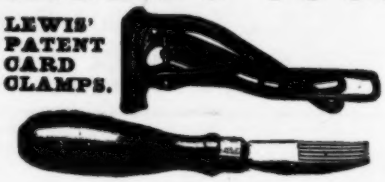

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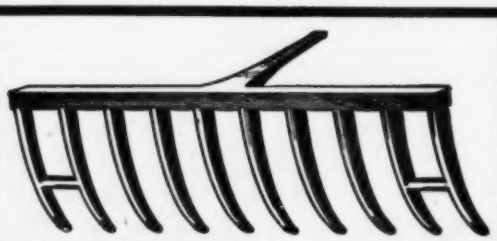

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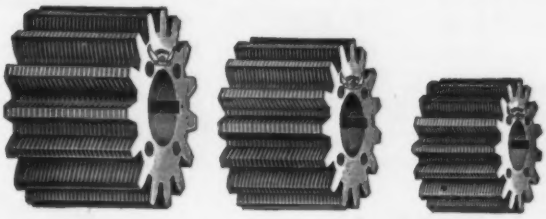

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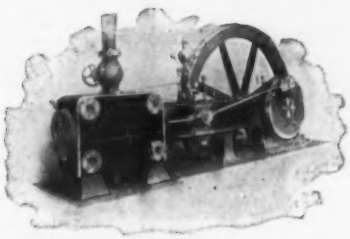

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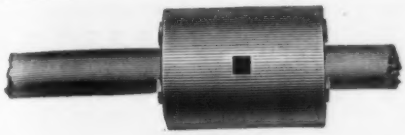

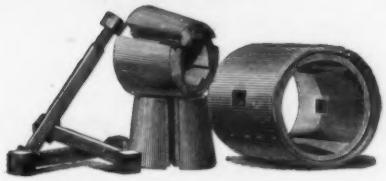

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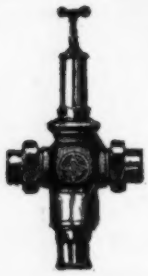

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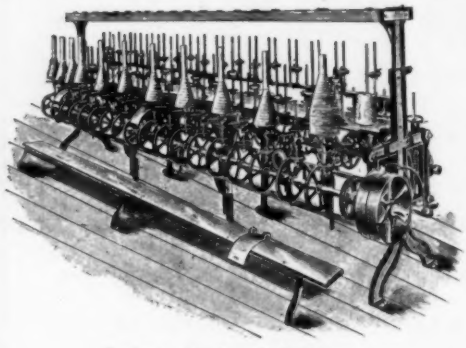

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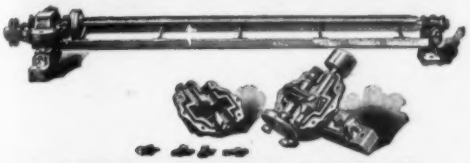

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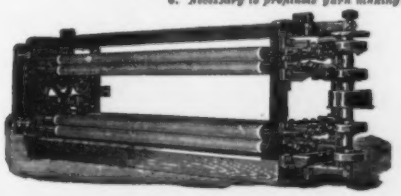

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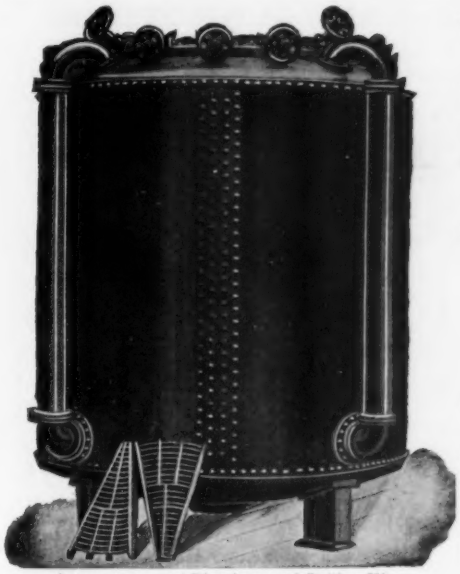

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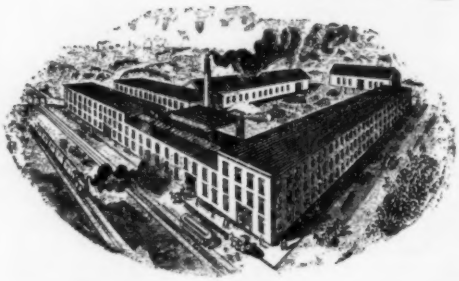

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FIG. 23

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The steadily increasing demand for the Lane Patent Steaming Basket demonstrates the truth of our claims.

**W. T. LANE & BROTHER,**

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**Formerly located at Port Chester, N. Y.** **Poughkeepsie, N. Y.**

# BALLOU BASKETS ARE BEST

UNCLE SAM generally buys only the BEST.

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ARLINGTON HEIGHTS, MASS.
(NEAR BOSTON)

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## BLEACHERS, DYERS AND FINISHERS

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**COLD AIR SYSTEM.** Simple, effective, inexpensive. **Leaves** yarn in beautiful condition.

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**HOT AIR SYSTEM** when great capacity is wanted.

**DYE STICKS,** Kettle Sticks and dry and sulphur house Poles, **also** Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

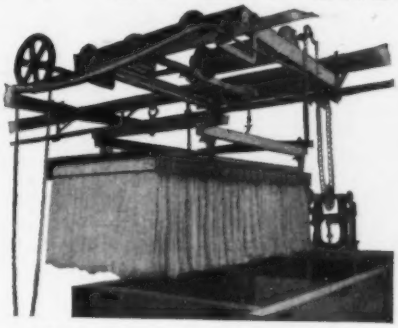
**Cedar Brook P. O., Camden Co., N. J.**

# The New Hussong Dyeing Machine

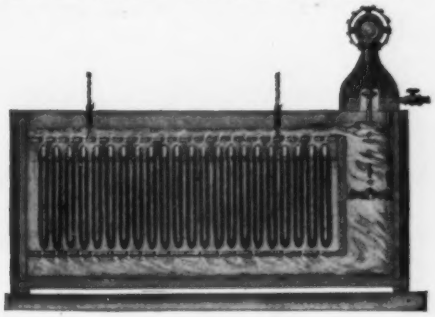
Patented Nov. 6, 1900. April 9, 1901.

**For Dyeing both Alizarine and Acid Colors on Yarn.**

**A PERFECT SKEIN DYEING MACHINE.**



STYLE A. Showing 300 pound Yarn Machine, with removable dye-sticks.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

**Points of Superiority Which We Claim for the Hussong Machine.**

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
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Reference Given on Application.

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**We Braze on Nibs.**

**We Repair the Ends.**

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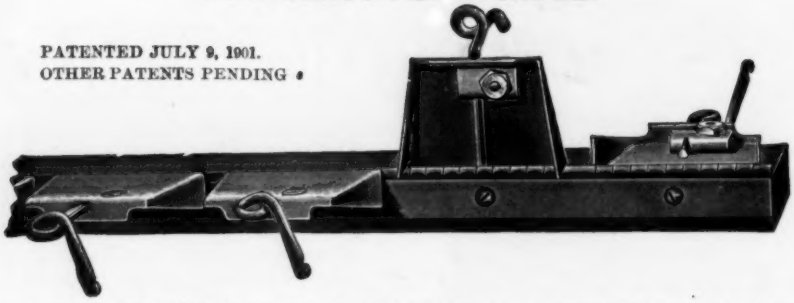
# ALL STEEL THREAD BOARD

with Hardened Thread Guides.

**7 1-2 CENTS PER SPINDLE.**

PATENTED JULY 9, 1901.
OTHER PATENTS PENDING



The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims.

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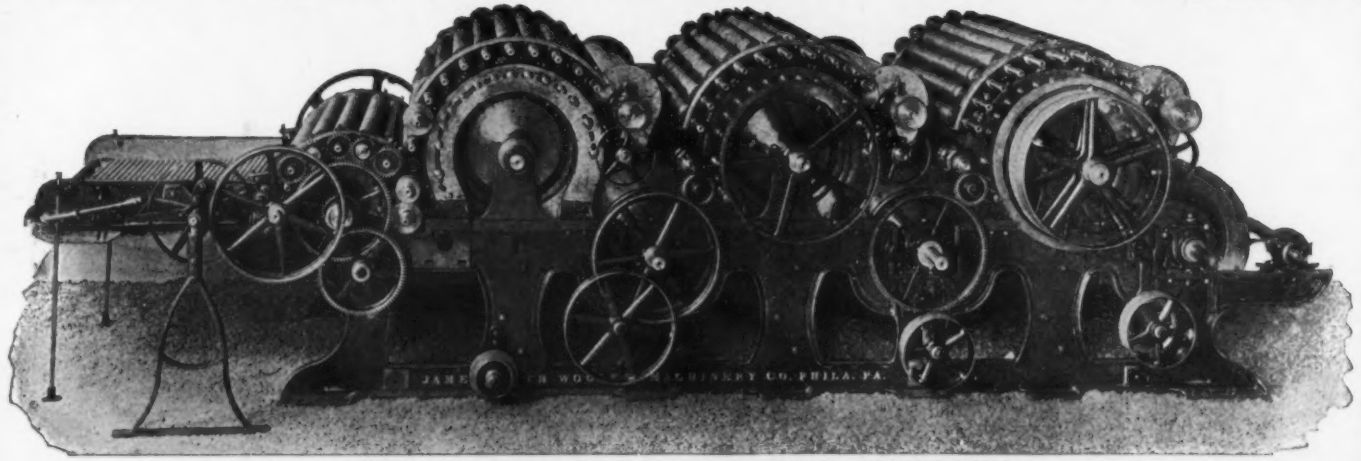

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Published Monthly by

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Copy for regular advertisements must reach publication office by the 25th of month preceding date of issue to insure proper attention. Transient ads., Wants, For Sale, etc., to go on Classified pages can be taken up to the 4th of the month of publication.

We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

## The Official Directory of the Textile Industries of the United States and Canada,

is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

## Foreign Advertising Bureau.

We are in close touch with all foreign textile journals and have their advertising rates on file and act as their agents for receiving advertisements and subscriptions. Any American textile advertisers wishing to advertise in Great Britain or the Continent may do it through our Foreign Bureau, which will advise as to best papers to use for different purposes, estimate the cost, prepare a correct technical translation into the foreign language, and attend to all details, correspondence, etc., including the payment of bills, so advertisers will have no more trouble than if placing an ad. in the TEXTILE WORLD RECORD.

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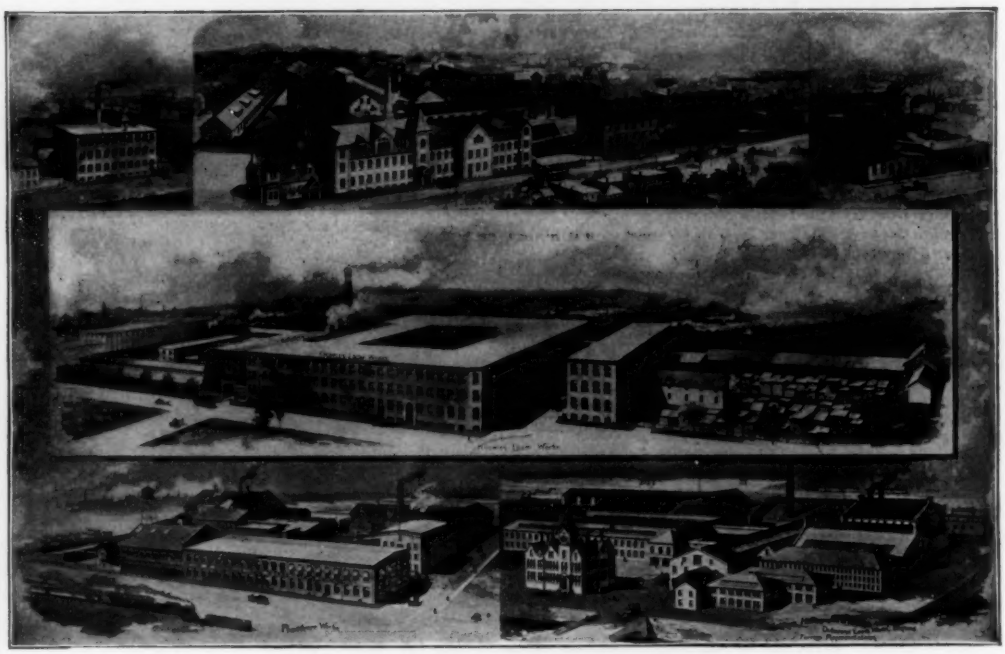
**WORCESTER, MASS.**

**Works: Worcester, Providence, Philadelphia.**



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**Dobbies, Jacquards, Combs, Drums.**

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**Foreign Representatives, Hutchinson, Hollinworth & Co.**

*DOBCROSS, ENGLAND.*

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## Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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# TEXTILE WORLD RECORD

COMBINING

**The Textile World and Textile Record.**

VOL. 25. (NEW SERIES.) SEPTEMBER, 1903 No. 6.

# Monthly Comment.

### Idle Mills.

During the past month there has been an extensive curtailment of production in both cotton and woolen mills. The shortage and consequent high price of cotton is the immediate cause for the shutting down of the cotton mills. As the price of goods has not advanced in proportion to the increase in the cost of raw material, the only course open to cotton manufacturers is to temporarily suspend operations. This course is being followed abroad as well as in this country. The result of such action will be to reduce the stock of cotton yarn and cloth. This will tend to equalize conditions by raising the price of goods and keeping the price of the raw material down. Until the actual consumption of goods is restricted by an increase of the cost of cotton goods to the consumer, the present balance between cotton supply and demand will not be affected. Retail prices have not yet been generally advanced. Bargain sales in cotton goods are as frequent as ever and the consumer has no reason to complain of the prices he is called upon to pay.

The shutting down of the woolen mills in this country is due not to a scarcity of cotton, but is caused by a lessening of the demand for goods. Under such circumstances the part of wisdom is to stop weaving cloth and this the woolen and worsted manufacturers are quite generally doing. The time has passed when mills ran night and day piling up goods in anticipation of a demand that almost invariably failed to materialize. Business methods have been improved and today our textile corporations are financially strong enough to close their mills and maintain a healthy balance between the supply and consumption of goods.

### A Businesslike Consul.

In another part of this issue appears an abstract from a recent report of H. B. Miller, U. S. Consul at Niuchwang, China, upon the cotton trade of Manchuria and the Russian and Chinese fabrics that have come in competition with American goods. These samples were sent to us by the Department of Commerce and Labor, and we are thus able to show half tone illustrations of the goods and give the results of our analyses of the fabrics. Consul Miller has made another report on the native silk fabrics of China, also accompanied with samples. The analysis and description of these goods will appear in a later issue of this journal.

Mr. Miller deserves credit for the efficient and practical way in which he is presenting

information regarding industrial conditions in his district. His example should be followed throughout the consular service.

### Cotton Goods in the Philippines.

The imports of cotton goods into the Philippines in March, 1903, is reported as follows:

| | | |
|---|---|---|
| Great Britain | 63.75 | per cent. |
| Spain | 12.19 | " |
| Germany | 5.12 | " |
| United States | 4.65 | " |
| Switzerland | 4.10 | " |
| British E. I. | 2.33 | " |
| Belgium | 1.53 | " |
| France | 1.49 | " |
| Japan | 1.39 | " |
| Others | 3.45 | " |

### The Woolen and Worsted Industry in Massachusetts.

The wages paid in Massachusetts to woolen and worsted mill employees during 1902 amounted to $17,776,691. This is an increase of over 15 per cent. as compared with 1901. The yearly average for each employee was $416.01 in the woolen branch and $397.76 in the worsted industry. The yearly average shows an increase of 3 per cent. for the woolen and 2 per cent. for the worsted workers. The total product of both woolen and worsted mills for the year was valued at $99,712,092.

### Silk in Servia.

The experience of Servia in establishing sericulture within her borders will be of interest to many of our readers on account of the attention given the industry at present in this country.

Several years ago the Servian government granted special privileges in the raising of silk to an Italian firm who abandoned the enterprise after three years of unprofitable work. The government then made a contract on April 26, 1899, with a Servian firm, H. S. Farkitch and Audgelkovitch, by which the latter were to make a free distribution of the grain (eggs) and have the exclusive right to purchase the cocoons under the following conditions:

1. The grain be obtained from a firm of high reputation and of a country having a climate similar to that of Servia.
2. An equipment to be provided for handling 22,000 pounds of cocoons in 18 hours.
3. A specialist who has had experience in the largest foreign silk establishments must be placed at the head of the enterprise in Servia.
4. The cocoons must be purchased at a price to be agreed upon.

The results as far as production is concerned have been very satisfactory as is shown by the following statement of production for the last seven years:

| | | Boxes of Grain Distributed, ½ oz. in each. | Production of Fresh Cocoons. |
|---|---|---|---|
| 1896, | By the Government, | 800 | 7,752 lbs. |
| 1897, | " " | 1,600 | 8,129 " |
| 1898, | " " | 2,500 | 28,014 " |
| 1899, | " " | 3,400 | 56,668 " |
| 1900, | By the Grantees, | 12,733 | 235,603 " |
| 1901, | " " | 15,200 | 284,098 " |
| 1902, | " " | 18,170 | 346,456 " |

According to statistics there were in 1898 in Servia 772,885 mulberry trees; 165,000 were planted between 1897 and 1901. Besides these there were 345,571 more making a total of 1,283,453 trees. Outside of the industry supported by the state a large number of farmers have engaged in the business on a small scale.

Last month the first hank of silk was reeled on the reeling machine at the agricultural department in Washington. So far only three machines have been purchased by our government, and it is the intention to send one of them to Tuskegee Institute. Two expert French women operators have been brought to Washington to give instruction in the reeling of silk. According to press reports Secretary Wilson is very enthusiastic regarding sericulture in this country, and has made arrangements to have several girls go to Washington to learn to reel the cocoons. Silk worm eggs and mulberry trees are to be distributed by the government.

### Electric Power in the French Household Industry.

From the application of electric power the household textile industry of Continental Europe has received a new lease of life. A few years ago it seemed as if the competition of the large mills would soon destroy that vast industry carried on in the widely separated homes of the people. The loss of an occupation which never afforded more than a bare subsistence to the workers had caused widespread destitution among a large part of the population, and the situation presented very serious social problems which seemed impossible of solution. The condition at present is by no means ideal, but it has been greatly improved by the establishment of electric power plants, the power being sold in small quantities at a low rate to the weavers and knitters throughout the country districts. The district around St. Etienne, France, has been especially benefited by this change.

Attempts to introduce electric power in the mills around Lyons have resulted in failure, owing to a great extent to the difficulty of adapting the machinery to this motive power. In the St. Etienne district, however, it has been found that the machines can be easily changed for electric power, and the success attained in this direction is seen in a comparison of the number of machines operated by electricity in St. Etienne for the past nine years:

| Year. | Shop. | Machines. |
|---|---|---|
| 1894 | 8 | 19 |
| 1895 | 90 | 214 |
| 1896 | 351 | 856 |
| 1897 | 782 | 1882 |
| 1898 | 1176 | 2706 |
| 1899 | 2380 | 5369 |
| 1900 | 2741 | 7149 |
| 1901 | 3270 | 7366 |
| 1902 | 3969 | 8736 |

The St. Etienne workshops are engaged chiefly in the production of ribbons and passementerie, and a marked revival of industry has taken place since electricity was made available. Immediately after the exhibition of electric power at Frankfort, in 1891, the Compagnie Electrique de la Loire was organized to develop the water power of the Loire and its branch, the Lignon, for the distribution of electricity throughout the district. There are about 28,000 ribbon looms in the Loire district of which one-half are at St. Etienne, the other half being in the neighboring country and in the mountains of Haute-Loire. As our list shows, nearly one-third of the machinery is now equipped with electricity and the new motive power is being extended rapidly to the remaining part.

Reports state that electrically equipped machines are capable of a much greater production at considerable reduction of cost. A great advantage is the fact that the power can be made available for the small as well as for the medium-sized work-shop. The result is that the St. Etienne household industry can now compete with the factories in Bale, and in many cases are able to excel them owing to their ability to produce special fabrics which can not be profitably manufactured in a large mill.

This use of electricity is by no means confined to St. Etienne but has extended throughout many districts in France and Germany. Recently an electric power company was organized to supply power to 500 ribbon looms scattered throughout four communes of the Forest of Hotzen and the mountain of Gorwhil. This company starts with a capital of $85,000, which it is calculated will be returned to the owners within a period of twenty years. The amount paid annually in wages to the ribbon and passementerie workers in this section of Germany is estimated at $75,000.

This use of great water powers for the production of electricity and its distribution among hundreds of homes scattered throughout a wide extent of the country presents an interesting aspect of the development of modern industries.

### Raising Flax in the West.

The attempt to develop the flax growing industry in Oregon has met with a curious and unexpected obstacle in the dislike on the part of the native workmen to stooping, a position that is necessary in pulling the stalks

from the ground. Cutting the stalks injures the fibre and so far all attempts to get sufficient workers to pull the crops have failed. Japanese laborers have been employed for two years and owing to their small size and endurance have proved very satisfactory for this difficult work.

### Changing the Current of the Hemp Trade.

A comparison of statistics of the Manila hemp trade for the two past years, shows how effective has been the law of March, 1902, remitting the Philippine export tax on hemp shipped to the United States. The total hemp exports from the islands for the 10 months ending April, 1902, were valued at $12,698,355; for the 10 months ending May, 1903, the value was $17,506,220, an increase of $4,807,865. Nearly the whole of this gain was due to the increase in the shipments to the United States, which rose from $5,129,974 to $9,911,549. The shipments to Great Britain remained practically stationary, declining from $7,094,973 to $6,900,972.

The imports of Manila hemp into the United States tell the same story. In 1902 the total imports of Manila hemp for the 11 months ending May, amounted to $10,286,599, of which $6,160,069 came direct from the Philippines, and $4,099,461 from Great Britain after having been carried from the Philippines through the Suez canal to London, and there reshipped to this country. In the 11 months ending May, 1903, however, owing to the remitting of the export tax above mentioned, the direct shipments to this country jumped 73 per cent. to $10,640,144 while our importations via. England decreased 79 per cent. to the comparatively insignificant amount of $880,519.

### Bleaching, Mercerizing and Coloring.

The Dingley tariff provides a specific duty of 1 1/4 cents per square yard. If bleached and colored and valued at over 12 1/2 cents per square yard, the duty is 40 per cent., or at least 5 cents per yard. In a recent decision the General Appraisers at New York draw a very fine distinction between mercerized goods that have been previously bleached and those mercerized without bleaching. By a previous decision of the appraisers, affirmed by the courts, the 40 per cent. rate had been assessed on goods mercerized without bleaching on the theory that "the mercerizing had developed the coloring matter inherent in the fibres to such a degree as to change and increase the color of the fabric from that of the unbleached or gray cotton cloths of commerce to what the Board found in that case to be 'colored' cotton cloth."

This seems rather far fetched, but having been accepted by the courts, was followed by the St. Louis custom officer, who collected a duty of 40 per cent. on a lot of mercerized goods which had been previously bleached. The importer appealed from this assessment to the General Appraisers, who now decide the goods were not "colored," inasmuch as the bleaching process had previously removed the natural coloring matters from the fibre. The opinion is in part as follows:

> The goods of the case cited had not been bleached prior to mercerizing nor at any time except in so far as the chemical action of the caustic soda upon the fibers of the goods affected such during the mercerizing process. As these goods were bleached before being mercerized, then their color, white, could not have been given by the mercerizing process, and they, so far as color is concerned, remain bleached goods not colored otherwise, if at all, than by bleaching. For "bleached" goods, whatever the incidental results of the bleaching process, duty is specifically provided.
>
> We find as facts herein—
>
> 1. That this merchandise consists of bleached cotton cloth that has been mercerized.
>
> 2. That no process or material affecting their color has been applied to them, except, if so, its bleaching process.
>
> 3. That they are of the count of threads per square inch, weight and value per square yard, as disclosed by the record in each case.
>
> We hold the goods to be dutiable at the appropriate rates for bleached cotton cloth under the provisions of the cotton schedule (pars. 304-310) as claimed. The protests are sustained and the decision of the surveyor reversed accordingly.

### Cotton Manufacturing in Massachusetts.

According to an official report recently issued, the cotton mills of Massachusetts paid $35,853,378 to their employees in 1902, an increase of over 9 per cent. as compared with 1901. The average amount paid to each employee was $382.22, an increase of 5 per cent. The product for the year was valued at $130,-

996,900. Estimating the spindles in the State at 8,362,869, and the operatives at 93,802, we have

Product per spindle for the year.....$15.66
Wages per spindle for the year.....4.29
Product per operative for the year..1,396.00

### Cotton Raising Under Difficulties.

The German cotton cultivaters in Togo and German East Africa are steadfastly pursuing their object under apparently insurmountable difficulties with a courage and determination to succeed that may well excite the admiration of the world. The soil and climate appear to be but indifferently suited for cotton raising. There are no railroads to transport the cotton to the coast, and the mules and oxen used for this purpose are subject to a distemper called "surrah". Foreigners are also subject to diseases which frequently prove fatal. The work of cultivating cotton continues, however, and recent reports speak of an anti "surrah" serum, discovered by Dr. Schilling, which is said to be efficacious in preventing that disease among the oxen and mules.

### Silk and Silk Goods from Abroad.

For the twelve months ending last June the raw silk imported into the United States was valued at $50,011,819. This was 17 per cent. more than in 1902 and over 66 per cent. more than in 1901. As all of the raw material for our silk mills is imported the increase shows plainly the increasing business done in this line of textile manufacturing. Of the total 49 per cent. came from Japan, 26 per cent. from Italy, 18 per cent. from China, 4 1/2 per cent. from France and 2 1/2 per cent. from other sources.

In spite of this large quantity of raw silk, all imported to be manufactured into silk goods for the domestic market, our silk mills fell still farther behind in supplying the home mark, for the imports of silk goods increased from $32,640,242 in 1902 to $35,962,854 in 1903, a gain of 10 per cent. The total imports of silk and silk goods amounted to $85,974,673.

### A Chance for Improvement.

It is not surprising that injustice is sometimes done in the administration of a customs tariff in a country having so large a population and area and such varied business interests as are found in the United States in 1903. It would be astonishing if cases of injustice did not arise and even more astonishing if no redress was to be found for them under a free government like our own. A protection tariff has been a potent factor in increasing the wealth and prosperity of this country. A departure from the protective policy has ever been the cause of hard times and a lowering of wages. Protection has become a national creed which no party dare disregard.

Something more than a schedule of tariff rates must be placed on the statute books to make that policy effective, and prevent its being rendered void by either smugglers or what is worse, the "construction" of free trade officials who may be temporarily intrusted with its administration. A customs administration act must reinforce a tariff act in order that protection may protect.

The present tariff law and customs administration law, judged by results, are the best the country ever had. They have magnificently supplemented Nature in making this country great and prosperous. Because they are so efficient in making protection effective, the true friends of that policy should be quick to correct any defect in phraseology or construction which makes them unfair and oppressive to either the honest exporter abroad or importer at home. We have recently had our attention called to a case which, beyond question, proves that the present interpretation of the customs act by some of our officials is not only oppressive but also absurd. The following straightforward statement of the facts proves this.

Theodor Groz and Soehne,
Manufacturers of Knitting Needles.
Ebingen, Wurttemburg, July 18, 1903.

*Editor Textile World Record:*

We take the liberty to call your attention to the following matter, not with a view of obtaining satisfaction, as by resorting to the different authorities we have probably already ex-

ceeded the term prescribed, but with a view of preventing, if possible, a recurrence of similar unfair treatment in the future.

In January 1902 we sent to the Richmond Hosiery Mills in Rossville, Georgia, 3 parcels containing each 3000 latch needles at $11.50 per thousand, and accordingly declared each parcel at $34.50 value. The Appraiser of Customs, however, regarded this value as too low, and, consequently, each package was appraised by him at a valuation of $44.00, making $7.11 more duty than was right. In addition to this the Appraiser imposed on us a penalty of 33 per cent. of $132.00 ($43.56) for wrong declaration of goods.

Our friends in Rossville then addressed a letter to the Appraiser of Customs of New York, complaining of the excessive taxation, as the value declared really equaled the wholesale price of the exporting country (as the respective paragraph of your laws reads), and especially complaining of the imposition of the fine, claiming that the latter should in any case be refunded, as there could not be the question of any fraud, which alone would justify such a step. Their claim was refused on the ground that the Appraiser considered that the "merchandise was properly returned."

Upon this our friends addressed the Treasury Department at Washington, from whom under No. 8203K they received the reply that they were unable to afford them any relief, because they had omitted to comply with Section 13 of the Customs administrative act of June 10th, 1890, which says that in case of dissatisfaction the notice must be given within 2 days after the appraisement of goods.

The U. S. Consulate in Stuttgart, to whom we then resorted, and who again referred the matter back to Washington gave us the same reply.

The correspondence which our friends again took up with the U. S. Treasury Department, and in which they explained that it was not possible for them to claim within 2 days, as the parcels took more than this time to travel from New York to Rossville, but that they made their claim immediately after receipt of the parcels, resulted in the contents of the enclosed 3 letters to the effect that "while the U. S. A. Treasury Department perceives the difficulties under which the Richmond Hosiery Mills labored, it is unable to dispense with a compliance with this provision of the statute."

The personal efforts of some Berlin friends to obtain satisfaction through the private medium of some high American officials were not successful either.

This is the story, and, as you will surely admit it involved a great injustice on the part of your American laws, and as we found that in your journal you always make yourself the advocate of all that is right and fair, we considered it good to point this matter out to you, hoping that you will call attention to the need of a remedy for this state of affairs in future.

All the correspondence entertained in this matter is at your disposal.

The correspondence referred to was as follows:

Rossville, Ga., June 2, 1902.

Messrs. Theodore Groz & Son,
Ebingen, Wurttemburg, Germany.

Gentlemen: Replying to your favor of May 20, before taking up this complaint with the Treasury Department, we would like to have you return the file of correspondence sent you, and also the correspondence you have had with them. We will file this entire correspondence before the Secretary of the Treasury.

In this connection we beg to state that we did make immediate complaint the day we took out the goods, and wrote the Department within two hours after we had taken out the goods. No one could be more prompt than we were. We were at first disposed to let the goods remain in the post-office, and believe it would have been the best thing for us to do, but if you will send us the correspondence we have had, we will try again to see what can be done toward recovering of this amount. We look upon it as an outrage, and very unjust.

Yours very truly,
Richmond Hosiery Mills.

---

Rossville, Ga., Aug. 9, 1903.

United States Treas. Department,
Department of Customs,
Washington, D. C.

Gentlemen: We beg to call your attention again to the enclosed correspondence regarding excessive valuation and penalty attached to shipment of needles made to us.

To review the matter, we beg to state that these needles were sold us at $11.50 per thousand; the proper invoice accompanied the shipment, which came through the parcels post. We complied with the requirements of the tariff, by writing the Collector of Customs the day we received the goods, protesting against the valuation that had been placed on the needles, and especially regarding the penalty.

We desire to bring these needles in from Germany, as it means a saving to us, but we cannot stand the excessive valuation that the appraisers put on them, and on top of that a penalty attached, as the valuations given are absolutely correct.

We wish relief in this matter, and wish the ex-

cessive appraisement and penalty refunded to us. We have complied with all the regulations of the Treasury Department, and do not see why we should not get relief.

You will note in the claim of the U. S. Consul that we did not make our objection within the two days fixed by law. We beg to differ with you, as we made our objection the very day the goods were received.

Awaiting your early reply, we are,

Very truly yours,

Richmond Hosiery Mills.

B.

The correspondence closed with the following letters from the Treasury Department:

Treasury Department,
Office of the Secretary,
Washington, October 3, 1902.

The Richmond Hosiery Mills, Rossville, Ga.

Gentlemen: The Department is in receipt of your letter of the 29th ultimo, further in relation to your importation of needles through the Parcels Post from Germany.

You state that you "did write the Appraiser of Customs the very day we (you) received the package of needles at our (your) Postoffice," stating your dissatisfaction with the values returned by him, and that it is a physical impossibility for you to give notice of dissatisfaction within two days after appraisement when you are unaware of the day upon which the goods are appraised at New York.

As heretofore stated, section 13 of the Customs Administrative act of June 10, 1890, requires that the notice of dissatisfaction shall be made in writing, to the Collector, within two days after appraisement. The Department perceives the difficulty under which you labor, but is unable to dispense with a compliance with this provision of the statute.

Respectfully,

O. L. Spaulding,
Assistant Secretary.

In the last letter the Treasury Department practically admits the injustice done, but states that the law must be obeyed. All officers should and are sworn to abide by the law. If a law is unjust it should be amended. Our enquiries lead us to believe, however, that the present administrative customs law is not construed at all ports, as it apparently was in this particular case, to require an importer to protest against an appraisal before he learns the appraisal has been made. We are creditably informed that at one port at least the law is construed by the Appraiser to mean that an appraisal is not completed until the importer is notified. This is the construction of reason and of common sense, and should be made uniform throughout the United States either by a ruling of the Department or an amendment of the law.

## Our Exports of Cotton.

For the year ending with June, 1903, the value, $316,100,000, of the raw cotton exported from the United States was greater than for any of the past fourteen years, although the quantity, 3,543,000,000 lbs., has been exceeded twice during that time. In 1898 we exported 3,850,000,000 lbs., valued at 5.98 cents per pound, a total of $230,400,000. The following year, 1899, the average price per pound sunk to the lowest level on record, 5.55 cents, and as a consequence the United States received in that year but $209,600,000 for 3,773,000,000 pounds of good American cotton. Since then the price per pound has been on the up grade and during the twelve months ending with last June we sold abroad 6 per cent. less cotton than in 1899 and received 50 per cent. more money for it. On the cotton exported last year the actual rise in price since 1899 amounts to an increase of nearly $84,000,000. This increase has been due to a rise from 5 1/2 to 9 cents per pound. Since this account was made up the price of cotton has risen to 13 1/2 cents and is now 12 3/4 cents per pound. Making allowance for the increase due to a temporary shortage just before the receipt of the new crop, and estimating that we can sell abroad as much cotton during the coming year at 11 cents as we sold last year at 9 cents, the value for the current twelve months will be $73,000,000 more than the record value of last year and $157,000,000 more than for 1899. Such a stream of gold toward our shores means prosperity for all of our people and particularly those living in the Sunny South.

It is said that the United States uses fully one-third of the world's supply of marketable silk. In New York city more raw silk is sold than is consumed in France.

# Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Most of the mill agents state that the volume of orders taken during the month of August has been most satisfactory, and that prices were in most instances on a parity with those of last year, with the exception of a few numbers of piece dyed goods and fancy worsteds. The demand for fancy worsted has been for several seasons on the wane, and this year the mills who make a specialty of manufacturing this class of fabric offered very attractive prices with the result that they acquired good size orders sufficient to keep their mills going several months, but it is questionable whether the prices secured will allow a fair margin of profit in view of the advance of the price of raw material; and the natural deduction follows that quality must deteriorate, or that the mill owners will be running their plant at a loss.

The flurry caused by the opening of lines at prices below those of last year subsided within two or three days and the market soon assumed its natural aspect. The number of buyers who have looked over the various lines has been unusually large, but the buying has been of the most conservative order, the average being about one piece of a style.

The most popular demand has been for soft twist woolens selling from 75 cents to $1.00, and piece dyed mercerized mixtures have met with considerable popular favor. Owing to their unsatisfactory wearing qualities thibets have fallen off very materially. Serges have been bought in large quantities, at satisfactory prices to buyers, and at a narrow margin to the mill. Very fair orders have been booked for home spun and crashes, and the prediction is made that these fabrics will gain in popular favor as the season advances, largely taking the place of flannels. Many of the lines that were counted upon as safe sellers have met with only partial success, while others that were looked upon as doubtful have met with unexpected demand.

The American Woolen Co., report having done very satisfactory business, sales aggregating within fourteen days fully two-thirds of the entire six months production of the plants under its control. The Company's annual production averages about 800,000 pieces. The mills have all been running on full time for months past, and the looms being operated to their full capacity. Nostrand & Moore state that they control 18 mills all of which are in full operation. They have recently acquired the control of the Maryland Woolen Mill, which makes a specialty of low grade kerseys and 54 inch heavy mixtures. They state that their trade this season has increased one-third over that of last year, and that each of their mills are running on full time.

Sullivan Vail & Co., are showing fancy worsteds unfinished and clear finished at $1.42 1/2, trouserings 14-15 oz. at $1.47 1/2, 14-15 oz. silk mixtures at $1.62 1/2.

The Dunmore Worsted Mills are showing a line of fancy worsteds under the Dunmore ticket at $1.10. This is a manipulated fabric with high color silk weighing from 13 to 13 1/2 ounces; also an all worsted line at $1.20 and silk and worsted at $1.35, on which they report very satisfactory business having been done.

H. & W. H. Lewis are showing an all worsted cloth at $1.27 1/2. Ethan Allen is showing very attractive lines of fancy woolens at $1.05, $1.17 1/2, $1.20 and $1.30. Forstmann & Co., are showing fancy worsteds; their Peerless they quote at $1.22 1/2, Orients $1.42 1/2 and their number 2659 range at $1.20. The lowest priced all worsted fancy that the American Woolen Mills are showing is a $1.10 fabric made by the Riverside. The Manton $1.10 unfinished fabric is spoken of most favorably by a large number of buyers. The Manton $1.25 clear finished fabric is sold at the same price as a year ago.

It is the opinion of several agents in the district that in one or two instances mills of some prominence have not done as well as they expected, and reports are being made that they have fallen considerably behind the average of business. It is also reported that considerable quiet business has been done

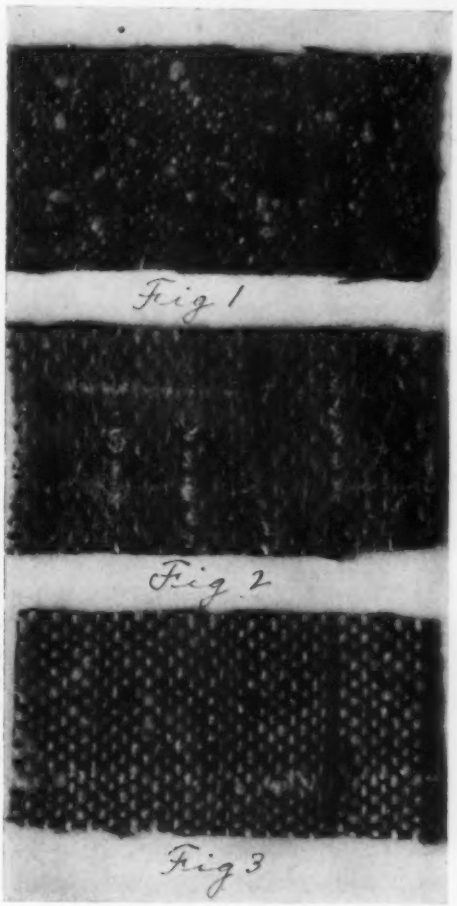
in fancy worsteds at very low prices but no confirmation of this statement could be secured.

DRESS GOODS.

There has been no lack of orders for all classes of fabrics, buying, however, was not early enough to procure satisfactory deliveries, and the strike situation in the Philadelphia mills has aggravated matters most seriously. Combinations in fancy mixtures have been used largely for walking suits and skirts; the demand for these has been the predominant feature of the month. Fancy effects are now largely reserved for general wear, and Scotch tweeds are eminently the goods for that purpose. These Scotch tweeds come in 54 inches wide and are quoted by the agents at prices varying from 62 1/2c. to $1.25. Their popularity for the time being is assured, inasmuch as they combine durability and dressy appearance at a modest price. Predictions are made, however, that their popularity will be of short duration, owing to the fact that the cutters up are buying them in large quantities for their lower priced suits and that there is too much similarity of design between the low priced goods and the better grades.

Zibelines, more especially the higher grade goods, are selling freely for immediate delivery. Monotones in the sheared variety are today the most popular. Low priced zibelines are not desirable as they do not give satisfactory wear, yet large quantities are being disposed of by the various selling agents. Cheviots are selling well and a good demand has been recorded on broadcloths. Coverts, especially in plain weaves and double and twist effects, have sold well for walking suits, corset coats and jackets. Large orders are now being received for Kerseys in the lighter weights, and there is every indication that this cloth will enhance in favor as the season develops. There is a bright outlook for such lines as voiles, Eoliennes, etamines and batistes for spring. In foreign dress goods, iuporters and jobbers report trade as being quiet, although improvement is being looked for very soon. Sellers have been somewhat disappointed in the movement of novelty goods for spring.

Mohairs are still in considerable demand, although primarily this is a spring and summer fabric. Importers predict that fancy mohairs both in checks, dots and stripes will continue in vogue for another season.



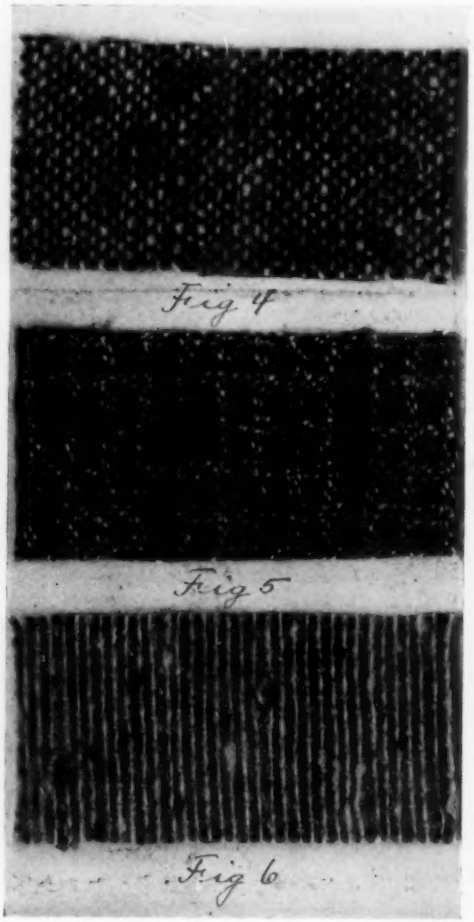

Creams, champagne and ecrus are now difficult to be found for spot delivery.

Fig. 1 shows imported Scotch homespun in the brown mixture; this is sold by one of the prominent New York retail dealers at $2.25. Fig. 2 shows a sample of genuine Oakney tweed retailed by the same firm at $3.50. This class of fabrics are undoubtedly among the leaders of high class novelties for fall suitings.

Fig. 3 shows one of the most popular fabrics in the domestic Scotch novelty effects. This cloth comes in 54 inches wide and is

manufactured by the Franklyn Glaser & Sons mills and sold through the commission house of Fleitman & Co., at $1.00 per yard.

Fig. 4 shows a fabric that is probably the




most popular design in domestic Scotch tweed that has been put on the market this season. This is sold by C. H. Cavalli through the commission house of H. A. Caesar; it comes in 54 inches wide and sold at 80c. less the regular discount. Similar goods, both in design and weight, is also sold by Fleitman & Co., H. A. Caesar and F. W. Corse.

Fig. 5 is the product of the Saxonia Mills, made in Philadelphia and sold through S. Pierls & Son. Figs. 6 and 7 are domestic novelties made in the Kensington Mills of F. A. Bochman and sold through Olbermann Domerich & Co. at $1.00. At Figs. 8 and 9 are shown domestic homespuns made by the same mills.

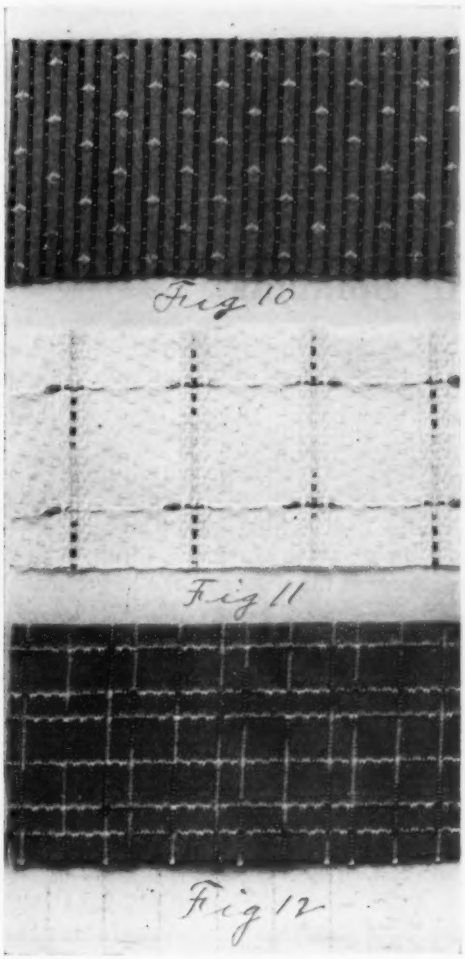
SILKS.

The fall business in silks has been somewhat of a disappointment. The raw material is very firm, owing, according to some of the manufacturers, to the speculative value at which it is held. The bulk of the demand

just now seems to be for black taffetas and peau de soies. Staples in colored taffetas are in fair request. Crepe de Chine, Peau de Cygnes and Louisines are all bought in considerable quantities for waistings.

Gun metal effects range in designs from the neat dotted to an inch and a half bro-

cades; fancies in small, neat designs are meeting with some degree of favor. Fig. 10 shows a pin dot self striped armure weave made in the Paterson mill of Jantzen & Pretzfeld, 19 inches wide and sold at 70c.




Figs. 11 and 12 illustrate samples of neat fancy effects in soft finished taffetas; manufactured by the same mill and are sold at 65c.

VELVETS.

Pile goods will be the mainstay of the silk department this fall. Plain and fancy velvets and velveteens have the strong approval of fashion and the most prominent retail buyers of the country. They will be extensively used for gowns, wraps and waists. Fancy designs in velveteens are meeting with ready favor; handsome corduroy costumes will soon be in evidence, and the outlook generally is most encouraging.

COTTONS.

No material change has taken place in this commodity during the past month with the exception that a certain class of lower grade goods are becoming more scarce. The situation will soon be acute, and great difficulty can be looked forward to within the next few weeks in securing domestic staples.

Jobbing houses will soon be in need of reassortments, and it is then that the trouble will begin.

## THE FALL MEETING OF THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION AT LENOX, MASS.

The seventy-fifth meeting of this association will be held at Hotel Aspinwall, Lenox, Mass., on Wednesday and Thursday, Sept. 30, and Oct. 1, 1903. The sessions will be held on the morning and evening of each day in order to give opportunities for visiting the many points of interest in the neighborhood. An interesting series of papers to be read at this meeting will include the following topics:

Adjustment of Preparing and Spinning Machinery.

African Cotton.

A New Fibre for Blending with Cotton.

An Improvement in Cards.

Blending and Mixing Cotton.

Bobbin Filling—Its Tendency to Kink.

Burke System of Automatic Mechanical Draft.

Electric Transmission of Power.

Egyptian Cottons.

Gambling in Cotton.

Power Variables in Textile Mill Practice.

Steam Turbines.

Storage Battery Locomotives for Mill Yards.

Waxes in Warp Sizing.

The attractions of the Berkshire Hills at this time of the year, and the ease with which Lenox is reached from points in New England and the Middle States, will doubtless lead to a large attendance.

Raymond & Whitcomb Company will have charge of the transportation; one party will leave the South Terminal Station, Boston, over the Boston & Albany R. R. in a special train of drawing room cars at 1 p. m., Tuesday, September 29, and reach Pittsfield at 5.10 p. m.; another train will leave from the Grand Central Station, New York, at 3.35 p. m., on the same date and reach Pittsfield at 7.30 p. m. Persons attending the meeting from the West will take a train leaving Syracuse at 11.10 a. m. and arrive at Pittsfield at 4.45 p. m.

This schedule is of course subject to change, but it is believed that it will be carried out without alteration. At Pittsfield carriages will be taken for a ride of five miles to the hotel at Lenox. The party will leave the hotel on Friday forenoon by carriages reaching Pittsfield for trains leaving about noon.

The expenses of the trip, including parlor car service, meals en route, transportation, care of baggage and hotel bills, will be from Boston or New York $25.00. The arrangements made by Secretary Woodbury ensure to all in attendance a pleasant and profitable occasion.

# French Worsted Spinning.

II.

*BY A FRENCH TEXTILE ENGINEER.*

(Copyright, 1903, by Lord & Nagle Co.)

Next, in order to judge the proportion of short fibres contained in the wool, which is a particular point in estimating the yield of wool at the comb or the percentage of noil, the taper of the tuft, A, B, C, D, E, is noted carefully from the point B, at which it is held, to the apex E. The larger the proportion of short stock the more rapid will be the decrease in the thickness of the tuft from B to E. If, for example, the thickness at C is one-half that at B, the point at which it is held, it may be estimated that the short fibres included between zero and the length B C, comprise one-half of all the fibres in the tuft. That is to say, the short fibres are equal in number to all the rest taken together. This is often the case in practice. Thus, the more rapid the decrease in thickness from B to E, the poorer is the wool and the larger will be the percentage of noil. The thickness of the tuft can be judged by observing the decrease of transparency at different points along the distance B, C, D, E. When holding the sample between the eye and a window it will

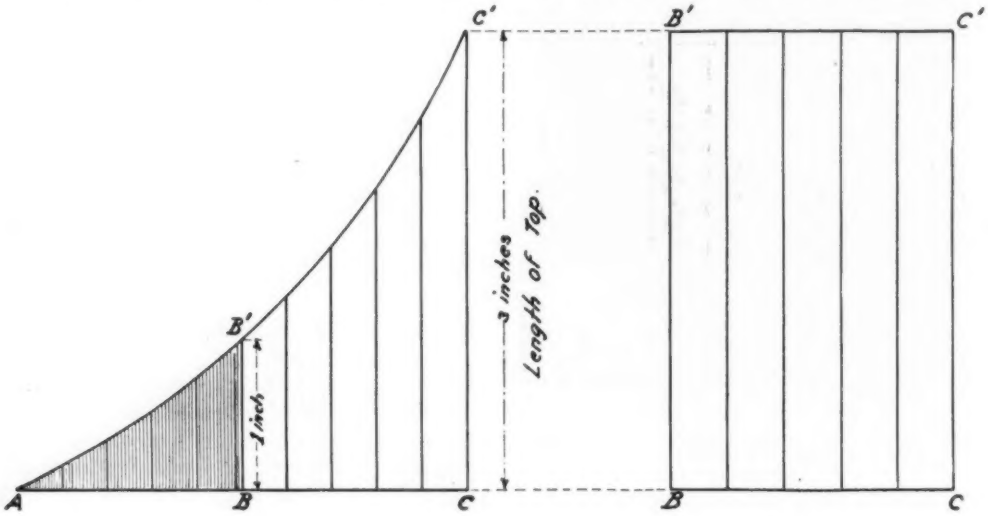



FIG. 11. FIG. 12.

be noticed that the part B C, is much less transparent than the parts C, D, and that the last is in turn still less transparent than the portion between D and E. All grades of wool present this transparency, but in varying degree depending on the quality, that is to say, the value of the wool as regards the length of the fibre. One can by this means judge with a considerable degree of exactitude the percentage of noil that a lot of wool will yield.

PEIGNE CARRE (SQUARE TOP.)

The term "peigné carré" (square top) is frequently used in the French worsted industry to designate the wool from which all the short fibres have been combed. Taken literally, the term "peigné carré" (square top) is absurd; no wool exists which consists of long fibres only. As we have already seen, all grades of wool without exception are composed of a mixture of fibres of different lengths, the short fibres being always greater in number than the long ones. All that can be expected of a good comb is that all short fibres below a given length shall go into the noil. This maximum length, by which the length of the noil is designated, can be regulated as desired by adjusting the machine. For example, if we have a wool of three inch staple and the comber draws into the noil all the fibres below one inch in length, the fibres in the top thus obtained will certainly not all be three inches in length; it would be a miracle if they were. The top will, in fact, be composed of a mixture of fibres varying from one inch to three inches in length. Fig. 11 represents such wool. The fibres in the space A B B′ go into the noil while the remainder of the stock, B B′ C C′, form the top. We can never obtain a peigne carre (square top), that is to say, a top with all the fibres of equal length as shown at Fig. 12. This term is, therefore, merely a way of speaking, and although incorrect, is nevertheless much used in French worsted spinning.

MANUFACTURE OF FRENCH WORSTED YARN.

We will now rapidly review all the operations through which the wool must pass from its arrival at the mill in the raw state, until its exit in the shape of spun yarn ready for sale. This will be but a general view; later we shall take up each process in detail, studying each machine and illustrating the description with drawings and photographs. For the moment we will merely show the reader what the French, or rather Central European system of worsted spinning is.

The manufacture of French worsted yarn consists of about twenty-one operations or successive passages of the stock through the different machines. That seems a great many, nevertheless they are all necessary, and it has not been found possible to simplify the work by reducing the number of operations.

Following are the first twelve operations which are the same for all grades of wool, long and short, fine and coarse:

| Order of Process | Operation | Machine | Approximate Draft | Weight of Sliver. Grains per Yard |
|---|---|---|---|---|
| 1 | Sorting | By hand | | |
| 2 | Opening | Opener or Shaker | | |
| 3 | Desuinting | Desuinting machine | | |
| 4 | Scouring | Scouring machine | | |
| 5 | Carding | Card (single or double) | 50 | 100 to 140 |
| 6 | Drawing | Intersecting or gill-box | 9 | 140 |
| 7 | Drawing | Intersecting or gill-box | 9 | 140 |
| 8 | Drawing | Porcupine Draw-box | 5 | 100 to 160 |
| 9 | Combing | Comb | 10 to 15 | 140 to 200 |
| 10 | Drawing | Can draw-box | 5 | 140 |
| 11 | Back Washing | Back washer with one gill-box | 7 to 9 | 140 |
| 12 | Drawing | Finisher gill-box | 5 to 8 | 140 |

The remaining operations are varied according as the wool is (A) coarse, (B) medium, or (C) fine. A. Operations for long and coarse top spun to coarse counts for knit goods. (Nos. 12 to 24.)

| Order of Process | Operation | Machine | Approximate Draft | Weight of Roving. Grains per Yard |
|---|---|---|---|---|
| 13 | Drawing | Can gill-box | 5 | 140 |
| 14 | Drawing | Can gill-box | 5 | 125 |
| 15 | Drawing | Porcupine draw-frame (with cans) | 4 | 110 |
| 16 | Drawing | Porcupine draw-frame (with cans) | 4 | 85 |
| 17 | Drawing | Porcupine draw-frame (with cans) | 4 | 40 |
| 18 | Drawing | Porcupine draw-frame (with cans) | 4 | 14 |
| 19 | Drawing (with twist) | Bobbin draw-frame (with porcupine) | 4 | 6.5 |
| 20 | Drawing (with twist) | Bobbin draw-frame (without porcupine) | 4 to 7 | 5.5 |
| 21 | Spinning | Mule or ring frame | 6 to 12 | .5 to 1 |

B. Operation for medium top and medium sizes. (Nos. 16 to 32):

| Order of Process | Operation | Machine | Approximate Draft | Weight of Roving Grains per Yard |
|---|---|---|---|---|
| 13 | Drawing | Porcupine gill-box | 4 to 7 | 140 |
| 14 | Drawing | Porcupine draw-frame (without rub-aprons) | 4 to 5 | 125 |
| 15 | Drawing and condensing | Porcupine draw-frame (with rub-aprons) | 4 to 5 | 110 |
| 16 | Drawing and condensing | Porcupine draw-frame (with rub-aprons) | 4 to 5 | 85 |
| 17 | Drawing and condensing | Reducer draw-frame (with rub-aprons) | 4 to 5 | 40 |
| 18 | Drawing and condensing | Large bobbin draw-frame (with rub-aprons) | 4 to 5 | 11 |

| | | | | |
|---|---|---|---|---|
| 19 | Drawing and condensing | Intermediate (with rub-aprons) | 4 to 5 | 7 |
| 20 | Drawing and condensing | Finisher (with rub-aprons) | 3 to 4.5 | 4 |
| 21 | Spinning | Mule or ring-frame (no porcupine) | 6 to 12 | |

C. Operation for fine top and for fine weaving yarn. (Nos. 28 to 56.)

| Order of Process | Operation | Machine | Approximate Draft | Weight of Roving. Grains per Yard |
|---|---|---|---|---|
| 13 | Drawing | Gill-box (without cans) | 5 | 140 |
| 14 | Drawing and condensing | Drawing (with rub-aprons) | 4 to 5 | 125 |
| 15 | Drawing and condensing | Drawing (with rub-aprons) | 4 to 5 | 110 |
| 16 | Drawing and condensing | Drawing (with rub-aprons) | 4 to 5 | 85 |
| 17 | Drawing and condensing | Reducer draw-frame (with rub-aprons) | 4 to 5 | 40 |
| 18 | Drawing and condensing | Large bobbin draw-frame | 4 | 10 |
| 19 | Drawing and condensing | Intermediate | 4 | 6 5 |
| 20 | Drawing and condensing | Intermediate | 4.2 | 6 |
| 21 | Drawing and condensing | Finisher | 4.2 | |
| 22 | Spinning | Mule or ring-frame | 7 to 13 | .2 to . |

We will now explain the object of each of these operations before taking up the study of each in detail.

### COMPOSITION OF RAW WOOL.

Different grades of wool from different countries differ greatly in the amount of foreign matter, suint, grease, sand, chaff, thistles and moisture which they contain. Thus the composition of two samples of unwashed merino wool may be as follows:

| | Sample No. 1 | Sample No. 2 |
|---|---|---|
| Earthy matter, sand, thistles | 10% | 20% |
| Suint, soluble in water | 30% | 35% |
| Grease soluble in alkali solutions | 9% | 10% |
| Moisture | 11% | 7% |
| Pure Wool | 40% | 28% |
| | 100% | 100% |

Following are four other examples of the composition of washed wool:

| | Sample No. 3 | Sample No. 4 | Sample No. 5 | Sample No. 6 |
|---|---|---|---|---|
| Earthy matter, sand, thistles | 1 | 1 | 1 | 1 |
| Suint, soluble in water | 12 | 28 | 20 | 6 |
| Grease soluble in alkali solutions | 9 | 12 | 10 | 10 |
| Moisture | 7 | 3 | 4 | 3 |
| Pure Wool | 71 | 56 | 65 | 80 |

From these illustrations it will easily be seen how widely the different wools vary from each other when received at the mill. Sample No. 2 unwashed wool contains but 28 pounds of pure wool in 100; adding the normal amount of moisture, there would be in each 100 pounds of raw wool 30 pounds of clean wool in its natural state. If the comb removes 10 per cent. of noil from this wool there would remain but 27 pounds of top or yarn. On the other hand we see that sample No. 6 washed wool yields 80 pounds of pure wool for each 100 pounds of raw stock. Adding the weight of moisture and subtracting 10 per cent. for noil we have about 77 pounds of top or yarn for each 100 pounds of raw wool. Thus according to the amount of grease, dirt, etc., in the wool, 100 pounds of raw wool will yield after dusting, scouring and rinsing, from 30 to 80 pounds of scoured wool, or from 27 to 77 pounds of combed top or yarn.

### SUINT.

Suint is the term applied to that more or less greasy substance with which wool is impregnated and which is the perspiration of the sheep. Combined with the oily substance secreted by the glands at the root of the wool and then becoming dry, it forms a substance quite hard, somewhat sticky and emitting a disagreeable odor. Suint is thus a mixture of two distinct substances: 1. The suint proper, which is soluble in either cold or warm water and composed in great part of potash, or rather, of a potash soap which in turn consists of a natural fatty acid (oleic and stearic with potash). 2. A natural grease (lanolin) not soluble in water but soluble in alkali solutions, such as solutions of potash, soap or ammonia, also soluble in benzine, sulphuret of carbon and other dissolvents of fatty materials.

### SORTING.

Upon arrival at the mill the wool is first sorted. This work is done by hand by workmen who thoroughly understand the structure of the different grades of wool. It consists of examining the fleeces one after another, separating the inferior from the better qualities and classifying the kinds in two, three or even four different sorts. For this purpose each workman is surrounded by three or four different baskets, each reserved for a different quality and into which he throws the wool as it is sorted. This is a very important operation, requiring great care, and upon it depends in great measure the success of subsequent operations.

### OPENING OR DUSTING.

The object of this operation is to beat and open up the lots of raw wool and shake out the loose foreign material such as sand, dirt,

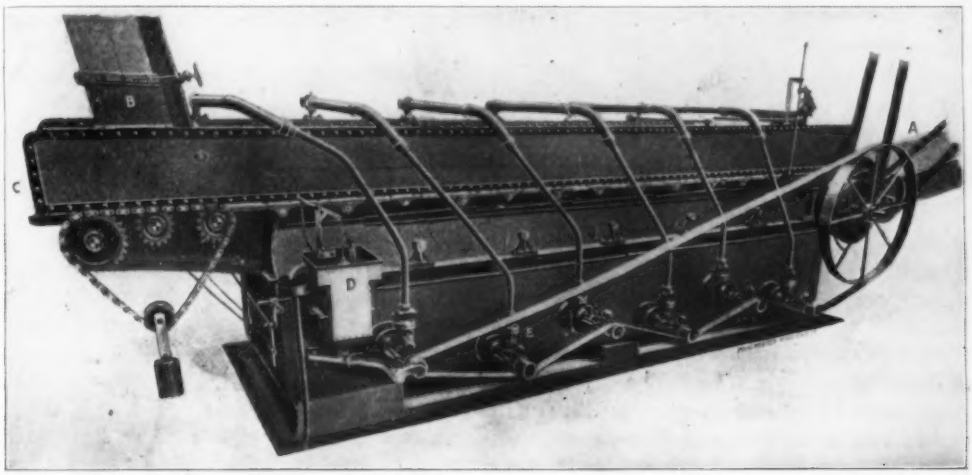
stones and large burrs, pieces of wood, etc., so that they may not unnecessarily pollute the scouring liquor by which the wool is to be subsequently treated. The wool is opened and dusted in a very simple machine which varies according to the builders, but almost always consists of an endless apron on which the wool is separated and which passes the wool to two fluted or saw-toothed rollers and which deliver the stock very slowly to a large drum; the surface of this drum is filled with coarse teeth resembling the horns of a cow and revolves rather rapidly. These teeth tear the wool from the feed rolls without breaking the staple and shake out the loose substances which drop through a grating surrounding the drum. The wool is stripped from this drum in a continuous manner by another drum or fancy, which turns very rapidly in the same direction as the first cylinder, but much faster, and is equipped with three or four leather wings or series of straps. This second drum, stripping the wool from the first one, throws it by centrifugal force into a conduit or large pipe, through which it passes to the floor below where the scouring machine is located. The wool is then free from all loose impurities, lumps, stones, etc., and ready for scouring.

SCOURING.

Scouring consists in reality of four distinct operations. Desuintage; Scouring; Drying; Oiling.

DESUINTAGE.

The object of this operation is to dissolve the soluble portion of the suint in water. The wool is first treated in pure cold water without soap. The water dissolves the soluble suint, which, as is well known, is in itself potash soap. Many manufacturers extract the potash, also the oleic acid from this liquor. Fig. 8 shows Malard's potash or suint extractor. It is attached in front of any wool scouring machine. The wool is fed on the apron, and after passing through the machine is fed automatically to the scouring machine.




[FIG. 8. THE MALARD POTASH OR SUINT EXTRACTOR. STODDARD HASERICK, RICHARDS & CO., AGENTS.

The wool passes successively through six compartments, each of which is provided with a centrifugal pump which circulates the liquor through the wool. An overflow is arranged from each compartment so that the liquor gradually travels through each compartment in a direction opposite to that of the wool. At the feed end it reaches the greatest density the nature of the wool permits, namely, 10° to 15° B. It may be automatically discharged from the machine at any strength.

SCOURING.

This consists in immersing the wool in a warm soap solution in the machine shown at Fig. 9. Generally black soap is used, that is,

potash soap. It is a dark brown paste with which everyone is familiar and which is often used for washing the hands because it cleans

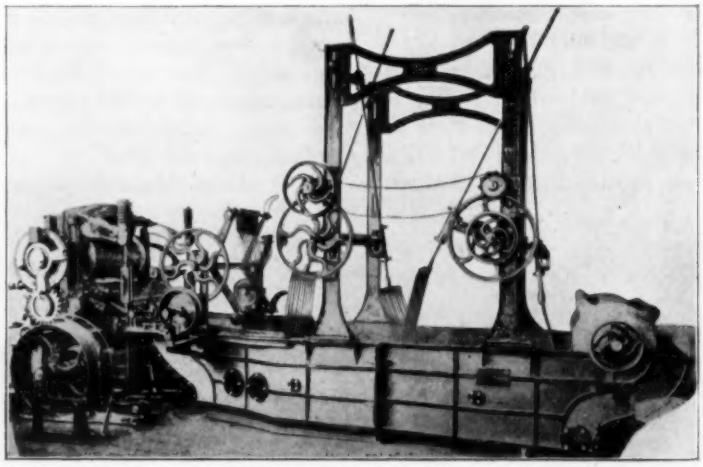


FIG. 9. WOOL SCOURING MACHINE, BUILT BY THE SOCIETE ALSACIENNE DE CONSTRUCTIONS MECANIQUES, MULHOUSE, GERMANY.

better than the ordinary white and hard soap, the latter being soda soap. The black soap is composed of ordinary vegetable oil, (such as olive oil), and potash; the two combined by boiling form black or soft soap. It is in fact the same substance as wool suint itself. The suint on the wool is, however, so mixed with dirt and other impurities that it cannot be relied upon to dissolve the fatty portion of the suint.

Scouring consists in treating the wool in a 1 to 2 per cent. solution of soft soap at 45 C. The wool remains from 2 to 3 minutes in this bath, after which it passes through two calender rolls, Fig. 10, which remove the surplus liquor. The wool drops immediately into another warp soap solution of the same composition as the preceding, but containing less impurities. After passing through the second bath, which requires from two to three minutes, the wool is again squeezed or extracted in calender rolls, and drops into a third warp solution of soap, likewise standing at 1° to 2° B., but being still freer from impurities than is the preceding solution. calender rolls and drops to nearly pure warm

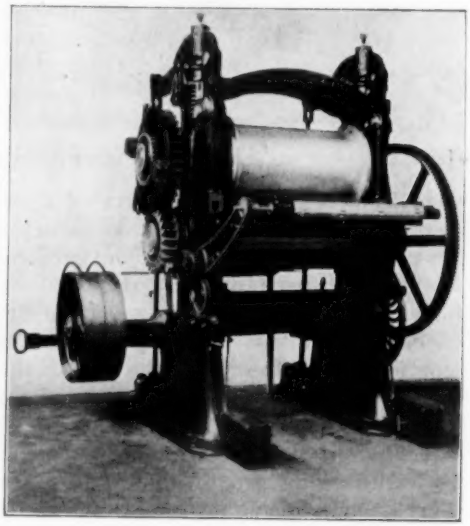


FIG. 10. CALENDER FOR WOOL SCOURING, BUILT BY THE SOCIETE DE CONSTRUCTIONS MECANIQUES, MULHOUSE, GERMANY.

After remaining in this bath for two or three minutes the wool is again passed through water at a temperature of 45° C. After two or three minutes the water is again extracted by squeeze rolls and the clean wool is ready for the drying process.

**(To be continued.)**

# Cotton Goods in Manchuria.

Much valuable information concerning the market for cotton goods in Manchuria is contained in a recent report to the State Department by H. B. Miller, our consul at Niuchwang, China. He sends samples of goods now being introduced into that market for the first time, and says that they are known as Ningpo native cloth and are being manufactured and handled entirely by Chinese. The company began operations about two years ago, and at present seems to be having considerable prosperity. Their place of production is at Ningpo, China, and vicinity. The cloth is made from yarns spun in Chinese mills and from imported yarns. The yarns are colored before being woven and the colors are fast and durable. The cloth is made in pieces 20 yards long and 25 inches wide. The price of these goods at Ningpo is $3 Mexican ($1.85 United States) per piece. The company furnishes the yarns to the villagers and pays them by the foot for weaving. The work is done on handlooms in the homes by women and children, whose earnings are only a few cents per day. The goods are meeting with much favor and the enterprise seems to have a most successful future. This is another substantial evidence of what China is doing in the development of cotton-goods manufacturing. These samples are evidences of their ability to produce a splendid quality of goods.

The great market for cotton goods in Manchuria is attracting the earnest attention of Russian manufacturers at Moscow. They are seeking to capture a good share of the $12,180,000 worth of the cotton-goods trade that annually comes through this port and are offering most tempting inducements to merchants here to go to Moscow to purchase their supplies.

Regarding the previous statement that a Russian agent had taken a number of merchants to Moscow to make a contract for the importation of drills imitating American products, the consul reports the return of these merchants to Niuchwang. The contract, they report, fell through because the drills were not quite up to the standard of the American in quality. The color was too yellow and the parties could not fulfil their promises as to price. They therefore made no purchase of drills, but purchased other goods to the amount of $34,800, such as watches, groceries, cambrics, prints, etc. This "imitation" venture has not been a success, and it is questionable whether the enterprise will be continued.

The completion of the Siberian Railway has certainly brought a new factor into the great cotton-goods trade of North China, and American manufacturers must be alive to the situation and adjust their business arrangements to meet these new conditions if they wish to hold their trade.

The Volunteer Fleet, heavily subsidized by the Russian Government, is bringing Russian goods to North China at very low freight rates, and these goods are being entered at Port Arthur and Dalny without paying any customs duties; besides, the port charges for ships are nominal and there are no pilot charges. American goods go first to Shanghai, where customs duties and port charges, storage, and handling are paid, and are then reshipped to Niuchwang, where freight, pilotage, port, and handling charges are again paid. These goods could be delivered direct to Dalny as cheaply as to Shanghai, if not more cheaply, and thence be distributed to Tientsin and other points in North China.

Unless it is considered useless to endeavor to hold and extend American trade in Manchuria, it is high time interested Americans were giving more earnest attention to the industrial and commercial changes now taking place in this part of the world. Recently an official of the Department of Commerce of Russia took a prominent native banker and four young Chinese merchants with him to Russia to interest them in purchasing Russian goods. Russia is trying to secure the trade and commerce of Manchuria. She has many traveling salesmen in this part of the world hunting for business.

A Chinaman by the name of Mang has

made three trips to Russia over the Siberian Railway to purchase Russian goods, mostly cotton fabrics. He has been quite successful, and is now organizing a much larger company of Chinese to continue the enterprise. The consul incloses a small line of samples of the goods he is successfully bringing from Moscow. By making these trips he has the advantage of selection from a great variety. In this class of goods the Chinese are especially desirous of variety. They do not care to purchase the same patterns twice. They want new designs each year. This is contrary to the general impression concerning Chinese taste, but it is very important. It is a knowledge of this and a catering to it that aids the Japanese in extending their trade with the Chinese. This characteristic is only true of figured or printed goods. With plain goods the reverse is true. The Chinese become accustomed to a certain "chop," or brand, and it is most difficult to get them to change.

While the Russian goods referred to are generally more expensive than American, they are making their way largely because they are fast in colors. Contracts are made for these goods delivered at Dalny or Port Arthur, where they are entered without duty. They are brought by the subsidized Russian Volunteer Fleet. This fleet, bringing goods from Russia to Vladivostock, Port Arthur, and Dalny, consists of 14 steamers, with a tonnage of 38,481 tons, and is annually subsidized to the amount of $309,000.

Our cotton manufacturers are deeply interested in the extension of the export trade in American cotton goods, and few if any of them could find opportunity to visit Washington and inspect samples sent to the State Department by Consul Miller. We, therefore, wrote to the Department at Washington asking that the samples be sent to us to be analyzed for the better information of American manufacturers as to the fabrics adapted for the Chinese trade. Through the courtesy of O. P. Austin, Chief of the Bureau of Statistics, Treasury Department, we received the samples and are now able to give the results of our analyses with illustrations of most of the fabrics.

The Ningpo native cloth is shown at Fig.

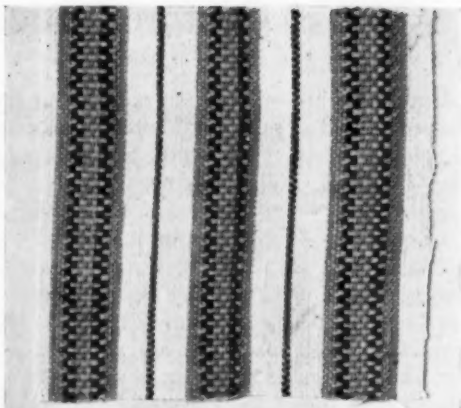


Fig 322

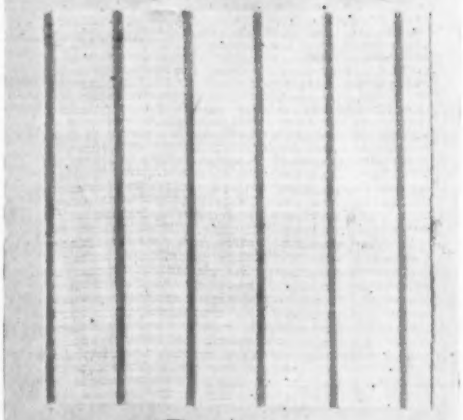


Fig 323.

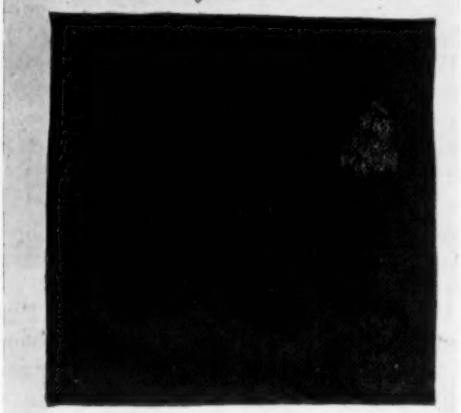


Fig 324

322. As already stated, the yarn is either imported or spun in Chinese mills. It is skein dyed and woven on hand looms, the Chinese weavers earning but a few cents per day. Our analysis of this cloth is as follows:

Ningpo native cloth, 1 piece equals 20 yards, 25 inches wide. Price at Ningpo, $3.00 Mexican per piece (U. S. $1.85 per piece, or 9 1/4 cents per yard).

Weight: 5 1/4 yards 25 inches wide per pound.

Warp: 51 7/10 threads per inch. Single No. 13 6/10 cotton.

Filling: 46 1/10 threads per inch. Single 17 7/10 cotton.

Loss by scouring: 5 4/10 per cent.

Fig. 323 shows a Russian print cloth sold at Niuchwang. The analysis results as follows:

Repce cloth, 1 piece equals 46 2/3 yards, 24 1/2 inches wide. Retail price at Niuchwang, 9 taels per piece.

Weight: 7.14 yards 24 1/2 inches wide per pound.

Warp: 97 1/2 threads per inch. Single No. 48 8/10 cotton.

Filling: 55 threads per inch. Single No. 19 6/10 cotton.

Loss by scouring: 10 2/10 per cent.

Fig. 324 is a dark Russian print. 1 piece equals 46 2/3 yards 24 1/2 inches wide. Retail price at Niuchwang, $11.00 Mexican (U. S. $7.15 per piece or 15 cents per yard). Analysis as follows:

Weight, 6 6/10 yards per pound.

Warp, 68 9/10 threads per inch, single No. 26 1/2 cotton.

Filling, 66 7/10 threads per inch, single No. 25 6/10 cotton.

Loss by scouring, 10 1/10 per cent.

Fig. 325 is a light Russian print, 1 piece equals 46 2/3 yards 24 1/2 inches wide. Price at Niuchwang, $11.00 Mexican per piece (U. S. $7.15 or 15 cents per yard). Used for bed covering, clothing and house furnishings. Analysis as follows:

Weight, 7.45 yards 24 1/2 inches wide per pound.

Warp, 81 1/10 threads per inch, single No. 33 8/10 cotton.

Filling, 66 7/10 threads per inch, single No. 30 3/10 cotton.

Loss by scouring, 6 4/10 per cent.

Fig. 326 is a cheap Russian print, 1 piece

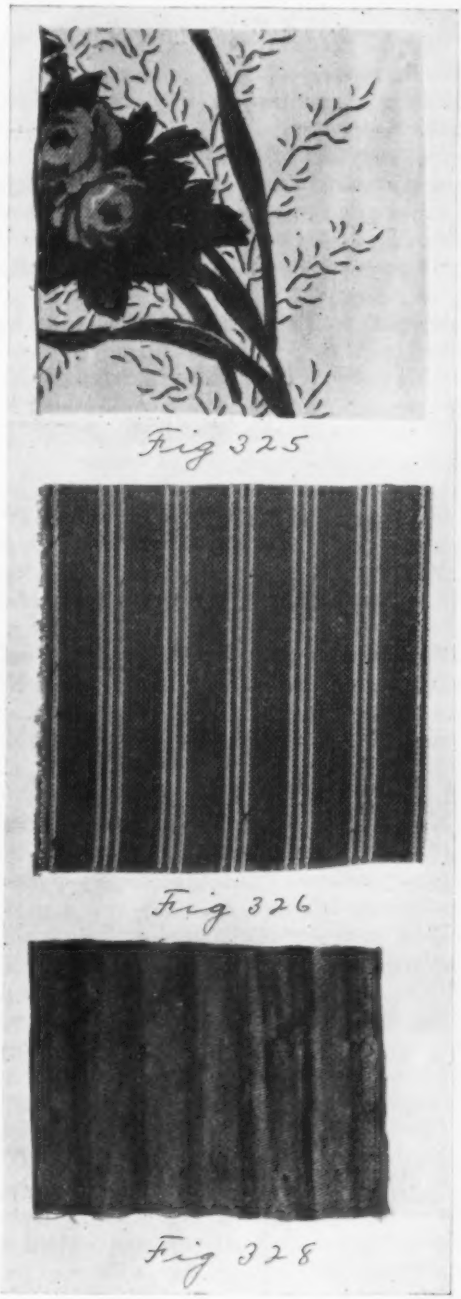


Fig 325

Fig 326

Fig 328

equals 46 2/3 yards 24 1/2 inches wide. Price $10.00 Mexican per piece (U. S. $6.50

per piece or 14 cents per yard). Analysis as follows:

Weight, 66/10 yards 24 1/2 inches wide per pound.

Warp, 83 3/10 threads per inch, single No. 29 7/10 cotton.

Filling, 65 1/2 threads per inch, single No. 29 8/10 cotton.

No. 327 is a plain Russian cotton cloth (not illustrated) sold as "linen", dyed light blue. 1 piece equals 46 2/3 yards 28 inches wide. Price, $11.00 Mexican per piece (U. S. $7.15 per piece or 15 cents yer yard.) Analysis as follows:

Weight, 6 1/4 yards 28 inches wide per pound.

Warp, 71 1/10 threads per inch, single No. 29 6/10 cotton.

Filling, 60 threads per inch, single No. 30 cotton.

Loss by scouring, 2 2/10 per cent.

Fig. 328 is a printed Russian lasting. 1 piece equals 46 2/3 yards 31 inches wide. Price $39.00 Mexican per piece (U. S. $25.35 per piece or 54 cents per yard). Analysis as follows:

Weight, 5 yards 31 inches wide per pound.

Warp, 108 threads per inch, single No. 49 1/10 cotton.

Filling, 172 threads per inch, single No. 53 7/10 cotton.

Loss by scouring, 3 3/10 per cent.

No. 329, not illustrated, is a heavy Russian cotton cloth, dyed red. 1 piece equals 46 2/3 yards 27 inches. Price 22.80 taels per piece. Analysis as follows:

Weight, 6 ounces per yard 27 inches wide.

Warp, 68 threads per inch, single No. 18 9/10 cotton.

Filling, 160 threads per inch, single No. 20 cotton.

Loss by scouring, 5 3/10 per cent.

Weave Filling, satin.

Cloth is napped on face.

No. 330, not illustrated, is similar to No. 329. It is heavy Russian cotton cloth, dyed blue. 1 piece equals 46 2/3 yards 27 inches wide. Price 21.60 taels per piece. Analysis as follows:

Weight, 6 7/10 ounces per yard 27 inches wide.

Warp, 64 threads per inch, single No. 20 cotton.

Filling, 168 threads per inch, single No. 17 1/10 cotton.

Loss by scouring, 10 per cent.

Weave Filling, satin.

Cloth is napped on face.

FIG. 331.

Fig. 331 is a light Russian print. 1 piece equals 46 2/3 yards 30 inches wide. Price $16.50 Mexican per piece (U. S. $10.73 per piece or 23 cents per yard).

Weight, 5.18 yards 30 inches wide per pound.

Warp, 90 threads per inch, single No. 30 cotton.

Filling, 66 threads per inch, single No. 27 1/2 cotton.

Loss by scouring, 5 4/10 per cent.

The sizes given are as found in the finished cloth, and without allowance for take-up or loss by scouring. These analyses will enable our manufacturers to judge of Russian fabrics and prices in the Chinese market. Samples of the goods can be seen at our Boston office by anyone interested.

# The Raw Silk Industry in the United States.

(Extracts from a pamphlet by Franklin Allen, Secretary of the Silk Association of America.)

The Silk Association of America is constantly receiving letters of inquiry from many parts of our country, chiefly, however, from the Southern States and California relative to the growing of raw silk. Not only these letters of inquiry, but frequent articles in the public journals and magazines indicate a widespread interest by many persons in sericulture, and one correspondent recently asked "What valid objections are there to American grown raw silk?"

The purpose of this paper is to answer some of these inquiries. The natural and obvious answer to the question just propounded is that there is no American grown raw silk. This answer suggests naturally the two following questions: Will there ever be American grown raw silk? What are the reasons why there is no American grown raw silk, in view of the fact that the United States are now such large consumers of this raw material?

The United States Census Report of 1900 shows that Italy does not produce more raw silk now than it did thirty years ago, and that France produces ten per cent. less than it did in 1870. On the other hand, it shows that the supply of raw silk from the Oriental countries has more than trebled since 1870, and that the per cent. of consumption by the silk mills of the United States in 1900 was as follows:

| | |
|---|---|
| Raw Silk from China | 34.3% |
| Raw Silk from Japan | 42.3% |
| Raw Silk from Italy | 19.7% |
| Raw Silk from France | 3.2% |
| Raw Silk from all other countries | 0.5% |
| | 100 |

Since that date the supply from Japan has increased, it now being about fifty per cent. of our consumption. There are hard commercial reasons, however, which account for these facts and these changes. The traveler in China and Japan may find, as is probably generally known, vast districts inhabited by the humble where the silk tree, the silk worm, and the cocoon are the most valuable possessions. From these come all that maintains the family. Planted around the hut in which the toilers live will be perhaps a few trees, and the cocoons reared by any one family may be only insignificant. But it is these numerous culturists that swell the annual total supply of silk until it becomes a very important article of commerce in those nations. In Japan there has been also many Government filatures. Through official effort the supply of raw silk has been greatly improved in the quality and reeling during the last twenty years, and its cost has also been reduced.

There are in the silk-producing countries two silk seasons annually, the spring and the summer. Silk produced in the spring is stronger and of greater length, but the color is not the best. The brightest and purest in color is the summer product, though it is weaker and not so long; a certain amount of silk is obtained also in the autumn. It is not much counted on, however.

### SILK REELING.

When the time arrives for the gathering of the cocoons the silk crop may be said to be harvested. It is always an event of importance, especially in the silk districts of Italy. The cocoons are, first, carefully sorted. Those that are sound are hard and unyielding. The gum is first softened in warm water, and then the reeling begins. This it is necessary to do by hand with patience and some skill. No bit of mechanical ingenuity has yet been provided suitable to take wholly the place of hand labor.

The fibre itself, as it is unwound from the cocoon, consists of two parallel, thick, glossy threads stuck together lengthwise. These are highly polished and do not disclose any irregular or uneven spots, which fact is expressed in a general way by saying that silk is structureless. It is a solidified liquid thread, resembling a glass rod. The reeler's

task is to bring together the filaments of two or more cocoons and to form them into one continuous, uniform, and regular strand which becomes the raw silk of commerce. Such cocoons must be selected in the assortment from which he chooses as will match in color, quality and evenness. The natural gum of the cocoon having been softened by warm, pure water, the ends of the filaments are gathered up by a brush, to which they attach themselves while in the water, and then the reeling begins. The reel in the filatures to which the silk is led consists of a light six-armed frame enclosed within a wooden casing having a glass frame in front, the enclosure being heated with steam pipes. To keep the strands from overlaying one another and adhering, the last guide through which the silk passes has a reciprocating motion whereby the fibre is distributed within certain limits over the reel.

### LABOR'S SHARE.

At $4.00 per pound for raw silk, the labor of silk growers in Italy receives, if I am correctly informed, $1.18 for the cocoons necessary to reel a pound of silk. The silk reeler receives 18 cents per pound, estimating 1 1/10 pounds as an average day's work. This amounts to $1.36 per pound for the operative's average share in every pound of raw silk produced in Italy. The remainder is divided between the land owner or the filature owner as the case may be, and the general expenses apart from labor's share. The average price of cocoons for the past ten years in Italy has not exceeded thirty cents per pound for fresh cocoons.

Incidentally I may say that the average person employed in silk growing in Italy will, during their five or six weeks' employment, take charge of, say, 20,000 silk worms, from which are produced say 50 or 60 pounds of cocoons, or, say, four and a half pounds to five pounds of raw silk.

Italy employs from 1,250,000 to 1,400,000 persons in her sericulture. The peasantry of Italy have been engaged in this industry for generations. If it is a profitable business there ought to be signs of it in the well-being of the people, in the size of the schoolhouses which the children might be expected to attend when not engaged in silk growing and in eating "polenta," which, alas! is too frequently their only daily food. The average wages received by the silk growers of Italy does not exceed $1.00 a week of seven days' employment during the five or six weeks of hatching the eggs, feeding the worms and spinning the cocoons. It is safe to say that the individual wage does not exceed five or six dollars for the entire six weeks of spring.

All the processes of silk growing require individual hand labor. If machinery could be applied to it the result would undoubtedly be different. Silk reeling, or combining in one thread the silk filaments from several cocoons, is also a skilful operation, requiring much pains and care. This, too, requires individual hand labor. It also requires conscientious effort on the part of the employees. Because of the lack of this essential element, the poorly paid labor of Spain and Turkey is unable to compete with the labor of Italy, Japan and China, notwithstanding the climatic conditions in both countries are highly favorable to raw silk culture.

As machinery plays no part in sericulture, Americans have been barred from utilizing the inventive genius which has revolutionized the elementary processes in so many departments of labor and branches of manufacture.

The cost of this labor in Italy and the Asiatic countries has continued to be so little from a remote period that the raw silk can be purchased there at less expense than any other country can afford to produce it. That is the one paramount fact which has always made sericulture in the United States, especially where labor is high-priced, not worth considering seriously. Nevertheless, it remains to be related that efforts have been put forth in spasms here and there in the South, in the Southwest, and in California since 1856 to establish sericulture and make silk a notable product. Although as a footnote added to history these undertakings may seem to represent no practical result or significance, the record of them should serve to show how vigorously and persistently the work has been carried forward to failure, even unto the present day.

With the termination in 1839 of the wide-

spread enthusiasm regarding silk culture and the mulberry trees, the first long period, beginning with the colonists of Virginia in the early years of the seventeenth century, may be reckoned to have come to a complete and final end. Practical experience became convincing at last that sericulture was without profit; and the undertaking of raising the mulberry and nourishing the silk worm has never been repeated along the Atlantic seaboard with any magnitude sufficient to concentrate much attention.

There is the fine and suitable climate, though, in the extreme South which always seems to give promise of so much that might be achieved in this easy and agreeable occupation. It is a tantalizing temptation. Again and again the possibility of succeeding, of creating a great source of national wealth and providing light labor for uncounted thousands, appeals to the imagination. Pamphlets are published to proclaim all the national advantages. Associations are formed, from time to time, to disseminate miscellaneous information about the silk worm. Tracts are scattered to make converts. No disputants rise to contest the statements about the sunshine, the temperate weather, the quality of the soil for the mulberry in Louisiana, the Carolinas, in Georgia, Florida, or Texas.

Then there is California besides. All the world is familiar with accounts of its genial climate. Nothing of the sort more desirable can be experienced in Southern Europe or in Asia. The white mulberry will grow and flourish in great abundance in California soil. Silk worms can be raised there apparently without limit. But when the time arrives in California—or in those geographical limitations of the South mentioned—to harvest the cocoons, the same old difficulty comes to pass that was encountered by the people who believed that the slaves brought from Africa, together with the native Indians, would reel the cocoons without cost. Neither the slave nor the untutored savage could pay for his keep by such labor. It required, and still requires the hand with some skill. That hand in this country cannot be employed for a few cents a day. If there are others in the world quite willing and eager to perform for any nation labor which, in the multiplicity of other better paying occupations, it does not find remunerative to do itself, perhaps it is a mere waste of sentiment to express any regret that the eternal fitness of things has been thus adjusted, our beautiful natural advantages notwithstanding.

### WILL IT EVER BE SUCCESSFUL?

It appearing, therefore, that American grown raw silk cannot be successfully raised under existing conditions the query arises, will it ever be successful as a commercial fact? Of this, one may not be too sure. We have seen so-called impossibilities turned into actualities in this marvelous country. It is not so many years since two men of great repute and highly esteemed for good judgment in business matters with which they were well acquainted were positive that neither lace curtains nor tin plate could be successfully made here. The well-known facts of today have overruled the opinion of both these experts.

If ever some genius should perfect mechanical devices to reel cocoons and splice the uneven sizes of their filaments into a perfectly uniform even single thread, then the conditions would be different. In that event, however, the same mechanical devices could be utilized in the countries of low wages, and sericulturists here would possibly be at the same disadvantages as now.

## TEXTILE CONDITIONS IN ENGLAND.

(From our special correspondent.)

Textile conditions in England are today a little "mixed," and while trade is in no sense good, it is not what can be called bad. Just in a "middling" way is what Yorkshire-men style markets, the tendency being on the quiet side in preference to anything else. I have no doubt that if men's minds were settled as to prices for either wool or cotton then we should see a greater volume of trade being done, for in both the staple industries of this country men are mostly uncertain as to what the course of prices is going to be. Given normal conditions I daresay that trade

would soon brisk up, but a hand to mouth policy prevails with most men anxiously waiting for something to turn up. However, most people are tarrying by the stuff and are likely to do so yet a while.

Dealing first of all with the wool trade, the raw article remains steady and firm, but is only firm in the case of merinos because holders are strong financially. Some surprise has been expressed in wool circles that 60's tops in the Bradford market should have fallen the last month two cents per lb., but to those on the spot the surprise is even more that values have not dropped four cents per pound. Nominally a super 60's top is quoted at 50 cents per pound, but the task would be in no sense difficult for me to supply an American order at 2 cents less. Bradford spinners are absolutely indifferent about buying at all, and the offers that they are making are more of a sporting character than anything else. The cost of 60's combing is no criterion whatever as to what they are worth, Bradford being today the cheapest market in the world. The fact of the matter is trade in fine wool yarns is worse today than during the past decade, and more worsted spinning machinery is standing than I have known for many, many years back. This is the best commentary on conditions as ruling in semi-manufactured articles, but when we come to look at the raw article itself we find that things are sensibly better and far away ahead of Bradford conditions. Raw wool is undoubtedly firm because of its relative scarceness, outside manufacturers being responsible mostly for this state of affairs. Had wool prices to be entirely determined at this time by Bradford alone we should see quite a slump, but other factors enter into the situation which are helping greatly to keep things steady in face of quiet conditions in the fine departments of the Yorkshire trade.

What has undoubtedly killed the merino trade of Yorkshire for the time being is the question of price per pound, or price per yard, men today resisting as strongly as ever every attempt to enforce higher values. The dearness of merinos has undoubtedly been the salvation of crossbreds, and in this department things "hum." Here there is a tremendous consumption proceeding, wool is good to sell, and although we are now between seasons, prices are unmistakably hardening. There is a great deal of quiet buying going on, especially in 40's tops, and topmakers having quite plenty to do are today selling more only at higher rates. There has been a larger movement in English wools than one has seen for years back, clearly indicating the free movement there is in crossbred qualities If conditions were as good in Botanies as they are in crossbreds, then the Bradford trade would be in a highly satisfactory condition, for everyone handling these qualities have as much to do as they can comfortably deal with. A good 40's combing is worth from 22 to 23 cents per pound.

Dealing especially with the manufacturing end of the trade, worsted manufacturers are by far the worst off, even makers of dress goods being quieter than usual. The fact is that the dress trade this summer has been a practical failure owing to the wet and also the want of sunshine. Bradford is also more or less out in the dress trade because fashions are running more or less on "tweedy" effects which are largely made out of mule spun yarns. This means that outside woolen manufacturers and particularly those around Yeadon and Guiseley are very busy, Bradford always being the best off for work when fancy shades and lustres are fashionable. Our wholesale dry goods houses have distributed very large quantities of these goods and have done fairly well, but manufacturers have fared the worst and are quiet today. Nothing to me is so significant as the increasing quantities of dress goods which Bradford is shipping to the United States. Last month there was a "record" total in dress goods for the present year, the amount being £56,841 which shows an increase of £30,282 on the corresponding month a year ago, every pennorth of which ought to be produced in the United States. Most of these goods are of the cheviot order, and can be easily produced out of short wool stock on the scribbling frames of United States mills. Nothing in my opinion is more simple to produce than these chevioty dress goods, and because of their cheapness they are largely selling.

Dealing now with the woolen trade, here

things are relatively better than they are in the worsted trade, mostly because fashions are favoring this class of staple. Our manufacturers have risen to the occasion by producing some most fashionable fabrics out of crossbred wools, and some are busy, though overtime is in no sense general. The most busy firm that I can hear tell of is the case of a man who is making rainproof covert coatings all in Oxfords and greys for the coming fall and winter trade. His price is 60 cents per yard, 55 inches, 16 to 17 ounces. These are exquisite things, and acknowledged to be excellent in value. The twist, which, of course, is the warp, consists of one thread of white worsted, the other woolen, twisted both together, while the weft is 18 skeins woolen. There is not a single ounce of pure wool in the blend, it being entirely made of mungo and cotton. The cloths are thoroughly shrunk, and are selling remarkably well. There seems to be a very good opening for this class of fabric in the United States, and simply being the four-end herring bone twill, are very easily made. The great thing of course is the method of preparing the stock, "buying it right," as an old manufacturer once said to me, for if the raw stock is bought right and the best value possible obtained, good salable fabrics are certain to follow. These goods will be in fashion for another season, and are well worth looking into.

The cotton markets of Lancashire are naturally all taken up with the American situation, and are much concerned over the immediate course of the article. The break in prices which occurred last month was hailed in some quarters with delight, and regarded as the beginning of the utter discomfiture of the bull party, but the recovery to the end of the month seems to suggest, if the simile may be varied, that the snake, so far from being killed, is hardly scotched. But if there is no evidence so far that short time in Lancashire and elsewhere has broken down the cotton corner, it has certainly done something to keep the price of cotton within bounds, and it has given the various distributing markets a much-needed opportunity to relieve themselves from what must have been a very unhealthy state of congestion. There are reports from all over the world of depleted stocks, but even yet no general demand has arisen of sufficient force to surmount the barrier of price. We must hope much from a continuance of extension of the drastic remedy of short time, and that it has not yet accomplished its work is sufficient evidence of its necessity. It has not yet dished the bulls, nor created a normal trade demand, nor brought a reasonable margin of profit to spinners and manufacturers. Largely it is a policy of necessity rather than choice. The scarcity of good cotton continues, and the very sparse movement of the old crop seems to confirm the opinion of those who held that high prices would bring all the available cotton forward rapidly. The large amount of cotton exported from Liverpool during the month has excited attention, but though a disturbing element under the circumstances, it has been pointed out that the feature is not unusual at this time of the year, except in so far that part of it is the reshipment to New York for tender against contracts.

Yarn sellers have gone through some very bad weeks, and though experiences are, of course, varied, most of them declare that it is impossible to sell even a four days output. There is some accumulation of stocks, particularly of wefts, but the August "wakes" will do something to relieve the position. Bolton spinners have been dropping out of orders for some time, and they are badly in want of orders to bridge them over the gap between present engagements and the advent of the new crop.

Naturally, the output of the looms has been greatly reduced, but is nevertheless quite adequate to calls. The home trade is naturally buying from hand to mouth. With India something has been done in light fabrics, but very little in good staple shirtings, and though good Monsoon reports come from Bombay that market is able to pursue the waiting policy that has obtained for so long. With China some fair transactions have been completed in low shirtings, fancies, and various specialties, and reports from Shanghai indicate the beginning of a healthier condition. Makers of heavy goods find no relief, and though printing cloths have been somewhat better Burnley has not found its holiday time too long. Lancashire is waiting

patiently for a lower range of prices, and not until quotations are reduced from one to two cents is it likely that trade will improve. This last few days there has been a rather uneasy feeling both in Liverpool and Manchester over the future, the slump in New York stock market being the chief contributing factor. The bull party on this side remains practically intact and is standing fairly well by New York, and it is freely asserted that no matter what the next crop is, prices are not going to be as low this next season as they usually have been. Still things should ease somewhat during the next month.

For high-class men's wear cloths the stripe or spot of mercerized cotton is doomed. The best merchants insist on the use of silk as I have pointed out before, mercerized is liable to take a stain from the groundwork of dark fabrics. Few of its dyes have been found permanent to light, it dirties easily, but the worst defect of all is its proneness to break. Some highly disappointing results have followed on the use of too much mercerized cotton in woolen goods. Now it is to be silk or nothing.

Advices show that less than 1 1/2 per cent. of the wool shipped from New South Wales in the first half of 1903 was consigned directly to America. Britain took 45 per cent. or 210,000 bales, Germany 23 per cent., France 19 per cent., Japan less than one-half per cent.

Of River Plate wool, England imported only 8 per cent. of the total export in the season. For these wools the world market is Antwerp, and the best customer is France.

By the most recent computation the annual product of the woolen or worsted industries of the United Kingdom is placed at 55 millions sterling; the consumption of wool at 670 million pounds, or the wool goods exported at the weight of 320 millions in the raw. Four-fifths of the wool supply comes from British soil and about four per cent. is home-grown.

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Fustian is said to be one of the most ancient of fabrics, its origin dating back at least one thousand years. It took its name from a suburb of Cairo, Egypt, where it was first made.

## THE COMMERCIAL MUSEUM OF THE PHILIPPINES.

This Museum has been established in the Philippines to encourage the development of the resources of the archipelago and extend trade with foreign countries. A collection and exhibition of commercial products will be made in the Philippines and commercial data will be collected and published for the benefit of the trading public. The Museum will also place on exhibition in the best foreign markets samples of native products with the object of increasing the foreign demand for them. Manufacturers are invited to co-operate with the Museum for the attainment of this object and to avail themselves of all the opportunities offered by the Bureau.

Exhibits will be placed in the Museum free of charge except in the case of heavy articles and delicate machinery, which the exhibitor will be required to install. Articles sent by rail or water to Manila will be looked after by the Museum; all freight must be prepaid unless otherwise arranged for. There are no customs duties on articles addressed to this Museum. Each article will be marked with the name of the manufacturer and the use to which it is put, the price, etc. In the case of valuable and perishable articles the exhibitor will retain the right of proprietor in them and change or discontinue his exhibit as he may desire. This is subject to the provision that the article cannot be removed when in any special exhibit or when it is wanted for such an exhibit.

All services are rendered without charge to the patrons of the Museum which is maintained by the Civil Government of the Philippines. It is believed that this exhibition will be a valuable means of developing the Philippines and increasing trade relations with foreign countries, particularly with the United States. All communications and articles for exhibition should be addressed to Samuel Shiley, Commercial Museum, Manila, P. I.

Mr. Shiley, in behalf of the Museum, invites the attention of American manufacturers and shippers to this opportunity for exhibiting free of charge such of their products as are suitable for the markets of the Philippine Islands.

All firms desiring to avail themselves of such facilities should send to the Museum their addresses and a list of the articles handled, terms of sale, time, discount, etc. This information will be placed in a classified card catalogue which will be open to the business public, no charge being made for the service. He also desires us to call the attention of American shippers to the fact that there is just complaint for insecure packing of ocean freight; bills of lading are not satisfactorily clear in detail and should always be in duplicate.

## SEX IN INDUSTRY.

The thirty-third annual report of the Massachusetts Bureau of Statistics contains some interesting data concerning the employment of females in gainful occupations in that state. The report states that the precise date on which women entered the factory is unknown. They were engaged in domestic manufacture, even from the earliest settlement of the Commonwealth making their own garments which they could not buy from the looms of old England. In nearly every home the fulling mill and the carding mill, the spinning wheel and the hand loom were part of the household equipment, and it was therefore natural that their entrance into industrial life should be in the manufacture of textiles. During the war for independence, domestic manufacture of all kinds was carried on in the home, and after the Revolution and the establishment of native industries, Massachusetts and the other New England States were dotted with thousands of little mills and factories, in which women contributed their share of the labor.

After the War of 1812, the revival of manufactures was enormous, immigration increased rapidly, skilled mechanics came from England, and men, who had been farmers in the summer and cobblers in the winter, found new occupations ready for their hands. They became mill operatives, machinists and iron workers, carpenters and masons, clerks and bookkeepers, or found employment in some of the older industries, such as tailoring and printing, shoe and hat making, etc. The rise of new industries and the development of old caused an increase in the number of working women who were on the same wage level as the men, and it was reported by a congressional committee on manufactures that in 1815 the average wage of cotton mill operatives was practically the same for men, women and children. This was before the introduction of the power loom.

So great and so rapid was the development of manufactures at this time that wages were very low, not because so many women had entered the industrial field, but because of the poor financial standing of the Commonwealth, the impossibility of increasing the circulating medium, and the eagerness with which enterprises of all kinds were undertaken without sufficient resources to fall back upon. When the reaction set in, social and economic conditions were in a state of chaos, while the condition of the working people, in the cities especially, was seemingly beyond solution. The labor market became overcrowded and the unemployed increased in number. Pauperism and crime grew. Population was rapidly becoming congested in limited areas, and the destitution brought

| DEPARTMENT | 1895 | | | 1885 | | |
|---|---|---|---|---|---|---|
| | Both Sexes | Males | Females | Females | Increase | |
| | | | | | Number | Per Cent |
| Carpetings | 3,421 | 1,479 | 1,942 | 1,591 | 351 | 22.06 |
| Clothing | 45,488 | 9,021 | 36,467 | 27,564 | 8,903 | 32.30 |
| Cordage and Twine | 2,024 | 1,060 | 964 | | | |
| Cotton Goods | 78,781 | 39,614 | 39,167 | 31,521 | 7,646 | 24.26 |
| Flax, Hemp and Jute Goods | 1,586 | 719 | 867 | | | |
| Hosiery and Knit Goods | 4,530 | 1,217 | 3,313 | 2,406 | 907 | 37.70 |
| Print Works, Dye Works and Bleacheries | 3,125 | 2,552 | 573 | | | |
| Silk and Silk Goods | 2,410 | 813 | 1,597 | 1,414 | 183 | 12.94 |
| Woolen Goods | 26,171 | 16,276 | 9,895 | 9,150 | 745 | 8.14 |
| Worsted Goods | 3,794 | 1,695 | 2,099 | 1,712 | 387 | 22.61 |

about by low wages and lack of constant employment called forth all the activities of the charitable.

An unskilled laborer, a hod carrier, a wood sawyer, or wood piler in a city was fortunate if he received 75 cents for twelve hours' work and found employment 300 days in the year. Hundreds were glad to work for 37 and even 25 cents in winter who in spring and summer could earn 62 1/2 or perhaps 87 1/2 cents by toiling for fourteen hours. It was not uncommon in winter for men to work for their board. Nothing but perfect health, steady work, sobriety, the strictest economy, and the help of his wife could enable a married man to live on such wages.

It was at this time that women of all classes entered the industrial field in large and rapidly increasing numbers. Their earnings, naturally, were lower than those of the men. Many trades and occupations, which either had no existence or were confined to the men, were then opened to them and they joined the army of workers either in the factory or at their homes. They might bind shoes, sew rags, fold or stitch books, became spoolers, sew straw braid for hats, or make coarse shirts and duck pantaloons at eight and ten cents apiece. Shirt making especially was eagerly sought after, because the garments could be made at home by the worker, who was commonly the mother of a little family, or a widow with no other means of livelihood. Yet the most expert could not finish more than nine shirts a week, for which they would receive 72 or 90 cents, while 50 cents seemed to be the average earning.

The earliest official figures regarding the presence of women in manufacturing employments appeared in 1831 when the National Census reported the employment in Massachusetts cotton mills of 13,343 persons, of which number 10,678 were females. In 1837 there were reported 15,366 females employed by establishments manufacturing boots and shoes, 14,757 employed as cotton mill operatives, 3,485 as woolen mill operatives, 605 by paper mills, 304 as straw goods workers, 190 by comb factories, 89 as silk mill operatives, and 21 as metal button makers.

Since those days the employment of females in manufacturing has increased by leaps and bounds until today they form 56 1/2 per cent. of the total number of employees in Massachusetts manufacturing industries, as shown by the accompanying statistics for 1885 and 1895. They outnumber the men in each industry with the exception of cordage and twine, cotton, print works and woolen industries. In each industry where a comparison with 1885 can be made the number of females shows an increase for the decade varying from 8.14 per cent in the woolen industry to 37.7 per cent. in the manufacture of hosiery and knit goods.

## Foreign Trade in Cotton Goods.

For the year ending with last June the value of cotton goods exported dropped to $30,900,000 from $31,300,000 in the preceding twelve months. With the exception of the last named period the exports of cotton for the year just ended are the largest on record. The slight decrease, $400,000, as compared with last year, is of trifling importance. As usual China was our best customer, the shipments to that country amounting to $13,786,835 for the year, or 45 per cent. of the total. This was $2,765,892 less than the exports of cottons to China in 1902, but in the latter year the amount was abnormally large owing to the settlement of the Boxer troubles, during which our shipments to China dropped $4,555,000 in one year, 1901.

The cotton goods imported in the year ending with last June show an increase of 18 per cent. as compared with 1902. The total, $52,460,000, is the largest amount on record. It is due to the prosperity of our country which enables the people to purchase still larger quantities of foreign goods despite the protective tax imposed on them. Nearly one-half of the cotton goods imported consisted of laces, embroideries, etc., which were valued at $25,110,081. Knit goods show an increase of $794,000, the total for the year being $6,157,744.

The sisal hemp of commerce is made from the leaves of the agave, which grows in Mexico, Central America and the southern part of the United States.

# TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

## THE COMBING OF COTTON YARNS.

(Continued from August.)

THE RIBBON LAP MACHINE

takes the laps as made on the sliver lap machine and transfers them into a more uniform lap ready for the comber. The advantage of this machine is that it takes out the individuality of the slivers which form the lap made on the sliver lap machine and thus gives an equally distributed amount of cotton for the combs to work on.

Generally six laps as made on the sliver lap machine are placed at the back of this machine on pairs of fluted wooden rollers. Each lap is slowly unwound by frictional contact with these rollers and is drawn forward by a series of four drawing rolls. In its passage to these rolls the lap travels over a balance lever which forms a part of the stop motion and corresponds with the spoon levers of the sliver lap machine, and also through a guide which is adapted to be readily opened or closed to contract and hold in the lap to any extent.

All along throughout the machine are arranged similar guide fingers on account of the tendency of the lap to spread out. The lap next passes through four sets of drawing rolls which have a draft of about six and which draws out the lap so that on emerging from the last pair of rolls it is in the form of a thin fleece. Each fleece then passes over a curved web plate to the front table where they are laid one on top of the other on said table, along which they are drawn by means of frequent pairs of press rollers to the lap head, consisting of a pair of heavy weighted calender rollers which consolidate the several fleeces and which are afterward wound into a lap on a wooden bobbin ready for the comber by means of two fluted winding rollers.

It will thus be seen that this machine is essentially a draw frame, the difference being that it draws and doubles narrow laps instead of slivers, while the doubling is done after the drawing which is the reverse in the draw frame.

The disadvantage found in connection with the machine is that on account of the fleeces of cotton being so thin at the time they are passing over the curved conductors, said fleeces are easily diverted from their proper course and in turn make irregular laps. However, as stated before, the object of this machine is to get the fibres in as parallel an order as possible for action upon by the needles of the comber and which is better accomplished by the use of this machine than if a draw frame is used between the card and the sliver lap machine and these laps subjected direct to the comber.

THE COMBING MACHINE.

In the original Heilman comber, there were in each set of six nippers no less than 564 parts, including those belonging to their fixings. From this an idea may be formed as to its complicated character. It took ten hours to set the nippers, which was a delicate operation, demanding the exercise of both care and skill. However, by the changes that have been made, the number of parts have been greatly reduced so that the process of setting the nippers can now be performed in half an hour, and is so simple that any carder can readily understand the method of doing it. The nipper has been so reconstructed that it holds the cotton to be combed against the fluted feed roller, thus dispensing with a cushion plate. The cotton is drawn into the top comb by detaching rollers, which draw it in a straight line from the grip of the feed rollers, thus combining great simplicity with efficiency. The working of the detaching rollers has also been simplified, so that they can be stopped with greater accuracy, thereby ensuring a more equal delivery at each stroke.

The different parts, formerly incapable of it, are now made adjustable, so that they can be more nicely regulated, and all wear be taken up with equal facility, while the connecting rods and half the joints have been dispensed with altogether. The comb cylinder is built up in segments around the centre, thus affording the greatest facility for taking it to pieces and quickly replacing damaged portions, while each row of needles can be removed for repairs without interfering with the others. While the combing process is very efficient in removing the shorter staple and impurities, yet it can only operate on carded cotton and is more or less a substitute for the second carding process as formerly in use.

One particular point in connection with combing is that the material must be acted upon lengthwise by the combs, since on the circumference of the comb cylinder there are from 20 to 30 combs arranged in rows, each row in regular order being finer than the one preceding it, there being in some machines 30 or more teeth in the length of one inch in the front row and perhaps 100 in the last. The object of this is that the cotton will be acted on progressively, the coarser needles preparing it for the finer ones which follow, thus ensuring the minimum of damage to the fibres with the maximum cleaning.

When considering in detail the various movements of the comber and their results, it must be remembered that the machine depends entirely upon an intermittent action of the several parts, and each operation is so dependent upon the other that the slightest variation from the correct time of acting, destroys the efficacy of the machine, and neutralizes the combing action.

The several operations of the comber are summarized as follows:—

The feed motion, in which the lap is fed to the cylinder to be combed, is of necessity intermittent, while the length that is fed is dependent upon the staple being used, the feed rollers only allowing a little less of the carding to pass at a time than is equal to the length of fibre which is to be retained.

The nipper motion, for holding the cotton during the process of combing, is intermittent in its action and is arranged to allow the cotton to go forward after it has been acted upon by the comb cylinder.

The actual combing operation follows next, by means of the rows of needles on the cylinder passing through the lap, after which the combed portion is taken on by a detaching roller and finally, the finished material is delivered by calender rollers to the draw box and coiler.

The amount of cotton taken forward by the detaching roller is not equal to the amount combed, only the longest fibres being taken forward so that the remaining fibres, augmented by the fresh fibres fed by the feed rollers, are again combed before being allowed to pass forward. Improvements have been made in the guides on the cushion plate, which prevent bad selvages through spreading and enable a wider lap to be used without increasing the length of the machine.

Laps are now made 7 1/2, 8 3/4 and 10 1/2 inches wide, where formerly only laps up to 7 1/2 inches wide could be used.

The production of the machine has also been increased and the number of nips per minute has been gradually brought up to as high as 100, where formerly 60 was the highest.

It is the greatest of necessity that the setting of the various parts of the comber is done with the utmost care and with a thorough knowledge of the material under operation, since considerable waste or else damage to the machine will otherwise result.

Although many different experiments have been tried, to in one way or the other improve the comber and increase production, yet the only improvement, which is regarded as of practical value, on the Heilmann single nip comber is the duplex comber. In the single nip machine all the principal parts act once for one revolution of the comb cylinder while in the duplex comber, all the parts act twice in one revolution of said cylinder. In the single nip machine, the cylinder carries only one set of combs and one fluted detaching segment arranged exactly opposite the comb segment, with two making up pieces between these parts, thus dividing the cylinder into four sections. In the duplex ma-

chine, the cylinder is divided into eight sections comprising two comb sections, two fluted segments and four making up pieces. All the parts operated from the cam shaft in this latter machine are made to act twice for each revolution of the cylinder by driving the cam shaft twice as fast while all the cams are somewhat varied in construction as compared to the single nip machine.

However, the duplex machine has many disadvantages compared to the single nip machine, one being that the quality of the work is not as good, since the cotton is acted on by only 13 rows of needles in place of 17 in the single nip machine and also that the timing of the various parts cannot be done as easily on account of the comb sections and fluted segments following so closely on one another.

One advantage claimed for the duplex comber is that the cylinder can be run at a slow speed and thus the needles passed through the cotton more slowly, in turn producing less waste and decreasing the wear on some parts of the machine.

(To be continued.)

## PRACTICAL POINTS ON SETTING AND TIMING COTTON COMBERS.

The key note to the successful working of a comber is in the proper timing and setting of the different motions. To have any one of the motions working out of exact harmony with the others is to sacrifice the efficiency of the machine, and therefore there must be some arrangement by which the timings and settings can be easily and accurately made, otherwise the time and labor of setting the different parts would prove very expensive and could not even then be made with entire satisfaction.

The arrangement used for the proper timing consists in an index wheel on the cylinder shaft. It has 80 teeth and its circumference is divided into 20 equal parts, the divisions being numbered from 1 to 20. There is an index finger which is stationary, and all settings are made by placing the required number on the index wheel under the index finger. The cam shaft is driven from the cylinder shaft by means of another 80 toothed gear, so that the two revolutions are the same and thus the index wheel can be used for the cam shaft also.

The settings and timings as adapted to ordinary work on the comber are as follows:

### SETTING AND TIMING THE CYLINDER.

Turn the cylinder shaft around until the index wheel which is placed on it has No. 5 on its circumference coincide with the index finger. Then bring the cylinders around on the shaft and with a 1 1/8 inch gauge, set the front edges of the fluted segments from the steel detaching roll, and secure the cylinders to the shaft by set screws. This is the initial setting and timing and all the others are made relatively to that one.

### SETTING AND TIMING THE FEED ROLLS.

The feed roll is set from 1 13/16 to 1 15/16 inches from the steel detaching roll by means of a gauge, that is, the front side of the feed roll is set from the back side of the steel detaching roll.

The feed roll is timed so that it begins to revolve when the index wheel shows No. 4 coincident with the index finger. The wooden lap rolls are driven positively from the feed roll, hence require no setting.

### SETTING AND TIMING THE NIPPERS.

The nippers require three distinct settings:

First, by means of screws, place the cushion plate up to the lip of the nipper knife, having a sheet of writing paper held firmly between them. It is very necessary to have them parallel, which is determined by having the tension the same at each end of the paper when it is pulled out.

Second, set the cushion plate from the steel detaching roll with a 1 1/4 inch gauge between the lip of the cushion plate and the flutes of the steel roll for good Egyptian cotton, and from 1 3/8 to 1 7/16 in. for Sea Island cotton, depending on the length of the staple used.

Third, set the nippers to the cylinder with a No. 19 gauge when in their lowest position, taking care that they are made parallel with the cylinder by means of the set screws which rest on the framing of the machine.

The timing of the nippers is performed by

placing the bowl, on the lever which through other levers controls the nippers, in the cam groove, so that it is just beginning to slide on the largest diameter, and having the index wheel set at 3 1/2 under the index finger. This position just opens the nippers. They should close at 9 1/4 on the index wheel. Secure the cam to the shaft by means of suitable set screws.

### SETTING AND TIMING THE TOP COMB.

The top comb should be set in the position which it will occupy while combing, that is its lowest position. In this position, the comb should be set at an angle of 31 degrees with a vertical line. It should be set from the back side of the leather detaching roll with a 1/16 inch gauge, and from the fluted segment of the cylinder with a No. 20 gauge, proper care being taken to have the comb perfectly parallel with the cylinder.

To time the comb, turn No. 5 on the index wheel coincident with the index finger, and set the cam on the cylinder shaft so that the comb is just down in its lowest position, that is, the bowl is just on the smallest diameter of the cam.

### SETTING AND TIMING THE LEATHER DETACHING ROLL.

Place the ends of the roll in their bushings and let the roll rest on the fluted segment of the cylinder; see that a No. 23 gauge can go between the bushing of the roll and the lifter block, taking the precaution to have it set parallel.

Time the leather detaching roll by having the roll rest upon the front part of the fluted segment and turning the index wheel so that No. 6 3/4 coincides with the index finger, the bowl will then just be on the largest diameter of the cam. The revolving motion being given to the leather detaching roll through contact with the steel roll, said steel roll should begin to revolve in the forward direction a little before the leather detaching roll reaches the fluted segment, so that there could be no chance for a difference in the surface speeds of the rolls and the fluted segment. For this reason the large cam at the end of the comber is adjusted to move the rolls when No. 6 on the index wheel is coincident with the pointer. The top roll should be set with the leather detaching roll, using a No. 21 gauge between them.

There are a few minor settings, such as setting the brush doffer, etc., but they are generally left to the discretion of the overseer.

A synopsis of the foregoing timings of the parts is given as follows:

| | | |
|---|---|---|
| Nippers open at | 3½ | index wheel. |
| Nippers close at | 9¼ | index wheel. |
| Lifters down at | 6¾ | index wheel. |
| Lifters up at | 8¾ | index wheel. |
| Top combs down at | 5 | index wheel. |
| Detaching roll moves forward at | 6 | index wheel. |
| Feed roll moves forward at | 4 | index wheel. |

### THE AMOUNT OF WASTE OR NOIL

taken out of the cotton lap may be increased in several ways, viz., by setting the top comb closer, by setting the cushion plates closer, and by feeding later.

### SPEED.

The speed of a comber is always spoken of as so many nips per minute, and on the Single Nip comber varies from 80 to 100 nips per minute, while on the Duplex comber, 100 to 120 nips per minute are obtained. The laps fed at the back of the machine should weigh from 260 to 300 grains per yard for short stock, and from 235 to 260 grains for long stock.

### LEATHER ROLLS.

All leather rolls should be well covered and should be perfectly straight from end to end. This applies especially to the leather detaching rolls. Rolls should be varnished once every week and loose bushings kept well oiled.

### CLEANING AND OILING.

All principal bearings should be oiled once a day, and minor bearings every other day.

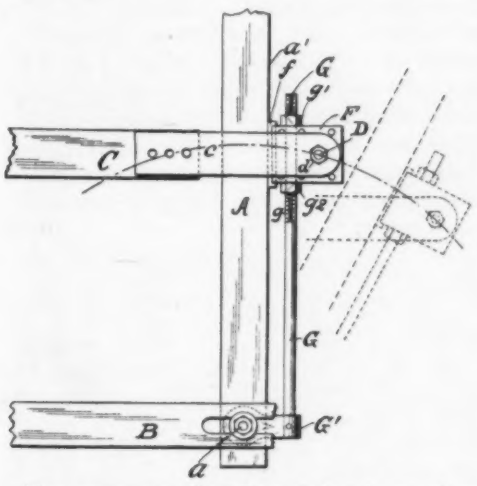
Gearing should be greased or oiled occasionally.

The detaching roll bearings should be kept clean and well oiled. The top combs should be cleaned at least once a day and the half laps at least once a week.

All adjusting screws, set screws, bolts and nuts should be set up tight at all times.

## KELLEY'S IMPROVED PICKER ACTUATING MECHANISM.

The novelty of the new picker stick connection consists in providing means for maintaining the striking face of a stricker block as carried by the lug strap parallel with the contacting face of the picker stick at all points of their swing, while at the same time permitting a limited swing of the stricker block free of the picker stick. This arrangement will result in providing a picker stick connection able to withstand satisfactorily the hard service a picker stick as well as lug strap is subjected to, identical to the jerky character of the operation of "picking." The new mechanism also provides means for ready adjustment of the lug strap to any leverage, i. e., power for picking required.




The accompanying illustration is an elevation showing the lower portion of a picker stick in vertical, i. e., picking position and having the new actuating mechanism applied thereto, another position of the parts (picker stick, etc., at rest), being indicated in dotted lines.

A description of the construction as well as operation of the new device is best given by quoting letters of references accompanying our illustration and of which A indicates the picker stick, which is pivoted at its lower end a to a fixed part B of the lay sword. C is a portion of the sweep stick, having suitably connected to it the lug strap c, the latter loosely spanning the former and projecting beyond it. This lug strap end c, is formed of two plates, rigidly connected at their outer ends by means of a bolt D, having a spacing sleeve (not shown) thereon, and a nut d. Upon this spacing sleeve is loosely mounted between the strap plates a stricker block F, provided with a removable striking face f, of leather, which forms a flat bearing surface of substantial extent to contact with the edge $a^1$ of the picker stick. For conveniently carrying as well as positioning the lug strap c and at the same time for maintaining the striking face of the stricker block F parallel with the contacting face of the picker stick A at any point of their swing, a supporting mechanism is provided, comprising a swinging arm G, pivoted concentrically with the picker stick at (a) by means of an attached piece $G^1$, so as to swing with the latter, and which is so connected with the striker block F as to maintain the latter in fixed relation thereto in their joint movement around the pivot a. This connection is effected directly and adjustably by passing the screw threaded end g of the swinging arm through a drilled hole in the stricker block F and rigidly securing the same thereto at a properly adjusted height from the pivot (a) by means of nuts $g^1$ $g^2$ on the threaded end of the arm, which end is arranged parallel with the contacting edge $a^1$ of the picker stick, while its pivotal end is mounted upon the common pivot a. It will be readily seen that by means of the construction of a picker actuating mechanism thus described, the striking face of the block F maintained square with the contacting edge $a^1$ of the picker stick, thus distributing the strain and wear of the jerky action of picking upon all parts of the picking mechanism.

## A NEW FRENCH HIGH SPEED SILK REEL.

This new silk reel is provided with vertical spindles, a feature which not only allows of effecting the reeling at a high speed, but also permits of uniting in a practical way "reeling and cleaning."

Of the accompanying illustrations Fig. 1 is a side elevation of the new reel, Fig. 2 being a vertical section, on a larger scale, of the bobbin and its spindle.

The skeins of silk to be reeled are placed upon the reels A and the threads passed over rotating hoods B. Thence each thread is

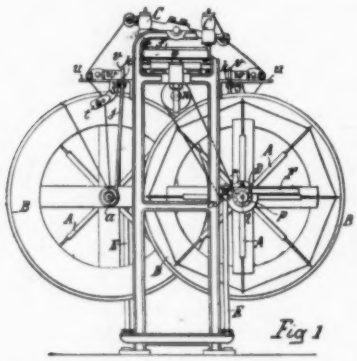


Fig 1

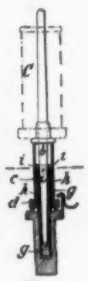


Fig 2

directed into a central wire eye a, situated in the prolongation of the shaft of the reel. On leaving this eye the thread passes to the bobbin C, which is mounted upon a vertical spindle (see Fig. 2 for detail). The spindle b, is surrounded by a sleeve c, having a pulley d, which is driven by a small belt e (see Fig. 1), set in motion by a pulley f. The lower end of the spindle b (see Fig. 2), rests in a step bearing g, which forms part of a vertical tube guided in the tubular support h of the spindle. In order that the step or bearing shall be always held above the bottom of the support, its tubular portion has shoulders i at its upper part, which project radially and fit in slots formed in the supporting-tube h. In this way the tube of the step or bearing g is suspended and at the same time prevented from turning in the support in which it is guided.

The central eye a (see Fig. 1) is placed at the end of a rod j, the upper end of which is pivotally mounted at k, the bent portion v coming against the rear face of the ring w, in order to limit the rearward movement of the eye a. By these means the operator can readily bring the eye a near to the circumference of the reel; in fact, quite up to its periphery. The eye returns automatically to its normal position in the prolongation of the spindle of the reel when the operator has passed the end of the thread to be reeled into the eye, this eye being returned to place and retained in such position by its own weight.

Each reel, with its corresponding hood and the spindle l of this latter, is carried by a support D, which instead of being permanently fixed upon the upright E or frame of the machine is movable on a horizontal slide F. Each slide extends across the whole width of the machine, its opposite extremities serving as a guide for two reels situated opposite each other, the reels being alternately arranged with respect to each other. The slides F are of straight rectangular section, and the reel carrying part has a collar provided with a hole, which is likewise rectangular, of the same section as that of the slide. The support D is prolonged by means of a turned and bored hub, which carries the reel A. In this hub the shaft which carries the rotating hood B turns, receiving motion from the slide opposite to the hood by means of a driving cord passing over the grooved pulleys n o. The pulley p of the shaft l is brought into contact with the pulley o, and the driving of the hood of the reel is effected by friction between o and p. The reel carrying support is fixed on its slide in position to maintain o and p in contact by means of a set screw r.

### SAVING IN SPACE.

The slide arrangement previously described, allows of a very simple and easy manipulation of the reel. By holding with the hand the complete reel carrying part entirely fitted—that is to say, with the reel and skein, the hood, and its small friction-pulley—it is only necessary to place it on the extremity of the slide at a distance of about 3 inches in front of the position which it has to occupy in working. It is then shielded from all possibility of shock or concussion against the neighboring part of the

machine. As soon as the sleeve or collar has become engaged with the slide F it only remains to push the part along the slide until it is in place, where it is fixed by tightening the set screw r. In this movement the reel always remains in the same vertical plane and is not exposed to liability of striking the parts near it or of being struck by them. By means of this arrangement the operator is enabled to bring the reels of a row closer together and to stay the reels of the two rows without danger of shock, thus saving a large amount of space.

Production. This arrangement, moreover, allows of readily placing a fresh skein on an empty reel without dismounting or removing any part of the machine. It is, in fact, only necessary to withdraw the reel carrying part from the slide. It is easy when the reel carrying part is thus withdrawn to place a skein upon the reel without interference of the hood by passing the skein on from the side at which the small friction pulley is situated. It is even possible by having a number of reels and several changes of hoods and reel carriers to place the skeins of silk on their reels in advance. By this means while an empty reel is being removed from the slide with one hand it can be replaced by a fresh reel having a skein thereon with the other hand, thus avoiding any loss of time. The hood B is made with a sheet of zinc in one piece turned up peripherally, and is provided with a turned in polished bead, which cannot injure the hand of the operator and, further, allows of the attendant finding the thread during working without stopping the hood.

LESS BREAKAGE OF ENDS.

As vertical spindles occupy much less space than horizontal spindles and are not bound down to occupying a determined position in order to receive their motion, but can, on the contrary, be readily shifted, we are by means of the new reel enabled to place the spindle which winds the thread from each reel almost above the next reel situated to the right, with the result that the thread coming from the central eye after having passed over the hood traveling from left to right leaves this central eye and passes up again from left to right. Consequently this thread surrounds the central eye for less than half its circumference, thus diminishing the tension of the thread and reducing the number of breakages to a minimum.

CLEANING.

Between the central eye and the bobbin the reeled thread passes into a first cleaner composed of two steel plates s t, covered with cloth and held pressed together. The thread issuing from this cloth cleaner passes into the steel cleaner u, both cleaners being in one and the same plane, i. e., tangential to the bobbin on which the thread winds. The two adjacent blades of two consecutive steel cleaners of a row are connected by a semi-ellipse, constituted by a brass wire which serves as a guide for the thread being reeled. The thread is thus compelled to pass between the two steel blades, which effect the cleaning operation, so that the thread cannot escape this operation.

## PRACTICAL POINTS ON THE MANUFACTURE OF TABLE CLOTH.

These fabrics are made on the jacquard loom, using as a rule either a 600, 900 or 1200 machine. For explaining the subject more in detail the accompanying series of three illustrations are given, representing in turn:

Fig. 1, the sketch for such a table cloth fabric, having its design reduced to one-half of its actual size, in order to bring the illustration within compass of the page.

Fig. 2 is a portion of the actual working design as executed on point paper, and

Fig. 3 represents, diagramatically, the tie up of the Jacquard harness required for weaving the present fabric.

Examining our sketch of the fabric, we find the same to contain one repeat of the borders, as well as somewhat more than one repeat of the centre (given in order to show up the design complete). As mentioned before, the sketch is given one-half its actual size in the fabric, the latter being constructed with a texture 74 × 112.

THE DESIGN FOR THE CENTRE OF FABRIC.

The repeat (width ways) of the design, a

to b, is 3 1/4 in. in illustration, × 2 (reduction) = 6 1/2 in. in fabric × 74 (ends per inch) = 480 (as near as practical) warp threads.

With reference to picks we find:—repeat in illustration 5 in., × 2 (reduction) = 10 in. in fabric × 120 (picks per inch) = 1,120 (as near as practical) picks. We had to use 480 warp threads in place of 481 (the actual product of the multiplication 74 × 6) for the reason that 480 can be evenly divided by 12 — the number of needles in one row of the jacquard machine (480 ÷ 12 = 40), and 1,120 picks on account of this number being divisible by 8 (the repeat of the satin as used in the design on the point paper for the weave in the ground portion of the fabric) 120 ÷ 8 = 15 without a remainder.

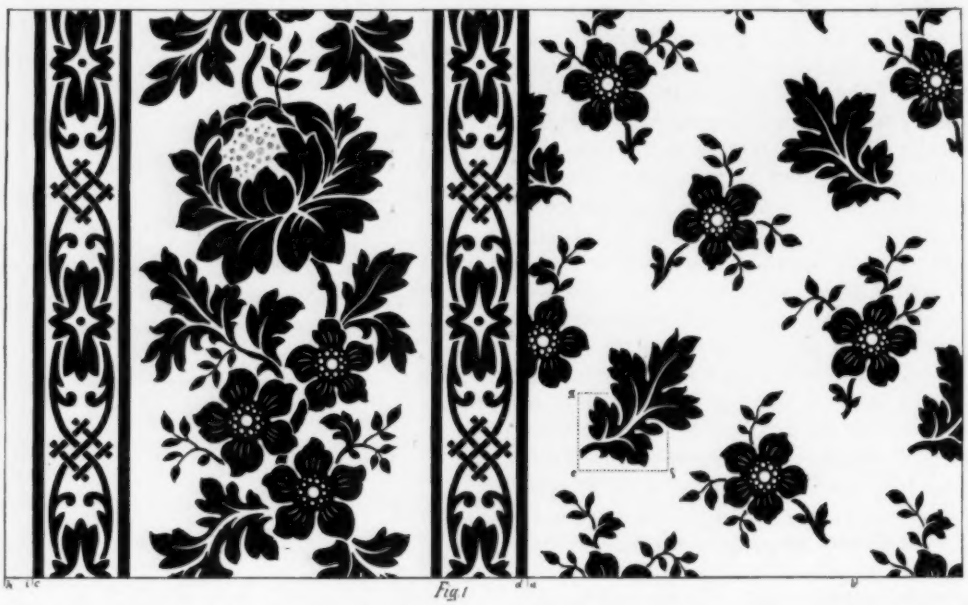


Fig 1

THE BORDER

in turn calls (width ways, c to d) for 4 7/8 in. × 2 (reduction) = 9 3/4 in. in fabric × 74 = 721 i. e. 720 as near as practical warp threads. With reference to picks the design in border corresponds to that in centre i. e. 1,120 picks are required.

THE DESIGN ON POINT PAPER.

This affair is readily explained by means of Fig. 2 showing a portion of the centre design (e-f-g) worked out on 8 by 12 point paper. The latter ruling of point paper we obtained thus:—

(warp texture in fabric) 74 : (filling texture in fabric) 112 : : (ruling of point paper for warp) 8 : (ruling of point paper for filling) X and 120 × 8 = 896 ÷ 74 = 12 4/37

i. e., 8 × 12 is the proper point paper to use, considering the texture of fabric previously referred to, and which is the point paper we have used (see Fig. 2).

THE MARGIN

is that portion of the fabric as situated between border and selvage, see h to i in sketch Fig. 1; in this instance calling for 5/16 i. e. 5/8 in. (in fabric) = 48 warp threads (as near as practical, since 48 is evenly divisible by 8 — the repeat of the weave to be used, as well as 12 the depth of the comber board).

NUMBER OF WARP THREADS TO USE:

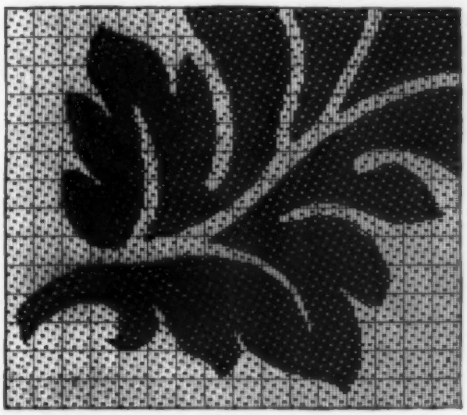
| | |
|---|---|
| Centre:—480 ends each section × 6 sections used = | 2,880 ends. |
| Borders:—720 ends each × 2 = | 1,440 ends. |
| Margins:—48 ends each × 2 = | 96 ends. |
| | 4,416 ends, |

exclusive of any selvage, and for which we may use 6, 8 or 12 double ends as the case may be.

THE TYING UP OF THE HARNESS

to be used in connection with the present fabric, is readily explained by means of Diagram Fig. 3.

The machine employed is what we term a 1,200 jacquard, i. e., a machine containing



102 rows, 12 deep, see a b c d, and of which the first 60 rows are used for operating the warp threads as forming the border of the fabric—see a b e f, and comprising needles, hooks, neck cords as well as leashes No. 1 to and inclusive No. 720. Every neck cord in this instance carries 2 harness cords,—one for each border. Neck cords 1, 12 and 720 only are shown in the illustration in order to simplify the tie up since too many lines only would bewilder. The last harness cords (No. 720) are distinguished by means of heavier lines.

The next 40 rows of the machine (g h i j), comprising needles, hooks and neck cords as well as leashes No. 721 to and inclusive No. 1,200 are used for operating the warp threads as weaving the centre portion of the fabric. Each neck cord in this instance carries 6 harness cords to the leash—one cord for each of the 6 centre sections. Leashes 721 and 1,200, i. e., the first and last harness cord for each section, only, are shown in order to simplify the tie up to the reader. Leash 1,200 is again shown by means of heavy lines

Row No. 101 and No. 102, i. e., the reserve rows of the machine (see rows k and l, shown shaded), are in turn to be used for operating the warp threads as weaving margin and selvage, using in the present instance one of these rows for either.

The row for the margin has to carry 8 harness cords to each leash (48 warp threads each margin ÷ 12 (depth of rows) = 4 × 2 (one margin on each side) = 8, whereas, provided we are to use 12 ends selvage on each side of fabric, row 1 will carry 2 harness cords to each leash only. Margin as well as selvage, are not shown in our illustration of the tie up, with reference to neck cords, harness cords and comber board, in order not to confuse the reader with too many lines, the comber board for this reason being shown broken away on either side. In our present

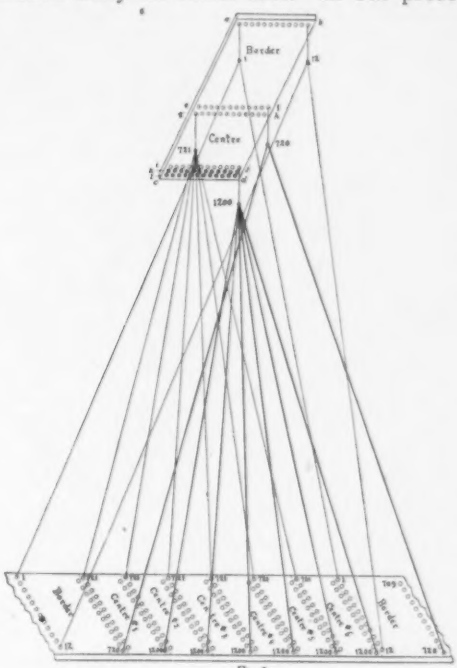



Fig 3

illustration we selected a straight through tie up for the border, which, however, in many instances is designed and woven with a "point tie up," especially if dealing with cheaper grades of table cloth fabrics, on account of thus being able to use a smaller jacquard machine, since the point type reduces the number of needles and hooks required for weaving it one half, thus permitting with lower grades of damask table cloth fabrics (lower textures) the use of a 600 jac-

quard machine. An example of this kind of tie up and its fabric sketch is shown by means of Fig. XLI of "The Jacquard Machine Analyzed and Explained," by E. A. Posselt* and to which the reader is thus referred. In some instances a point and straight through tie up combination is used for the border, an example of which the reader will find by consulting Fig. XLVI of the work above referred to. Having thus given a thorough explanation of the manufacture of regular damask table cloth, we will in our next issue explain how the more elaborate class of these fabrics (using compound harnesses for it) are made.

*For sale at this office. Circulars of book, postage free, upon application.

## AN IMPROVED NIPPER KNIFE FOR COTTON COMBING MACHINES.

One of the main features of a cotton combing machine is a cylinder, fitted with rows of needles which during part of the revolution of said cylinder, pass through the portion of the cotton lap which projects beyond the grip of the nippers, which in turn are situated above the cylinder. The top nipper is known as the "nipper knife" and the bottom nipper is known as the "cushion plate;" the improved construction relating only to the nipper knife. As is well-known, the nipper knife is constructed with a flange called the "lip," which projects beyond the lower edge of the cushion plate, in order to force or carry the cotton fibres into contact with or into the path of motion of the needles on the rotary cylinder in order that the cylinder needles may better penetrate and thus rid the cotton under operation of all short fibres and impurities. It is to the construction of this lip the present improvement more particularly refers.

In the adjustment or setting of the nipper knife as heretofore constructed it is necessary to allow sufficient space between the edge of its lip and the path of motion of the needles' points to enable these latter to pass or travel clear of said nipper knife without actually being brought into contact with it under any circumstances; otherwise the needle points would be damaged and rendered unfit for service. Means whereby the nipper knife can be set considerably closer to the path of motion of the needles' points, and that without endangering their efficiency, thus enabling said needles to operate upon a greater quantity or thickness of material are given in the following explanation:—

Fig. 1 is a sectional elevation of a portion of a combing machine, showing the application of the improved nipper to the machine.

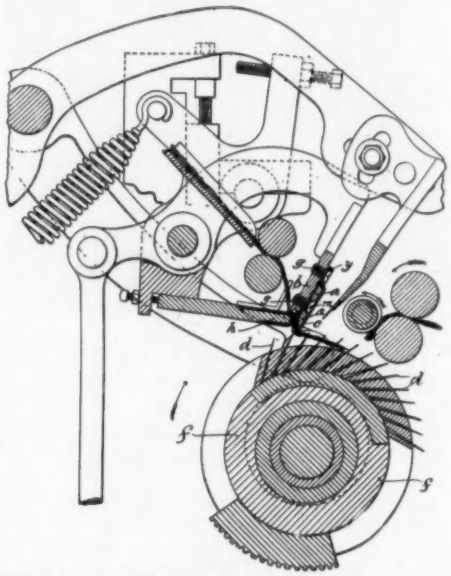


Fig. 2 is an end elevation of the nipper knife.

Referring to the figures, A indicates the lip of the nipper knife B which is so shaped that it can be covered with a piece of leather C, in order that provided any of the points of the needles D on the cylinder E are brought into contact with the end of the lip A, they will be able to pierce or cut through the leather C without being damaged or rendered unfit to perform the necessary combing action. By this means we are enabled to press the laps or slivers of fibres passing beneath this lip A closer down upon or into the path of motion of the needles D, without endangering the efficiency of said needles; in this manner greatly increasing the output of the comber.

The method of attaching or securing the leather C over the lower edge of the lip A is by making the lip A detachable from the nipper knife B. The lip A is covered with the

leather C by having one of the ends of the leather secured between the lip A and the nipper B by means of the screw F, which is countersunk into the lip A. The leather then passes around the lower edge of the lip and up over the face of said lip where its other end is fastened to the nipper by means of the strip G and the screw H.

In some instances the whole lip may be made of vulcanite, wood fibre, compressed papier mache, etc., as a substitute for the leather covering, which answer the same purpose of preventing any injury to the cylinder needles, although preference is given to the leather covering as first mentioned.

## THE MANUFACTURE OF TURKISH TOWELS AND BATH ROBES.

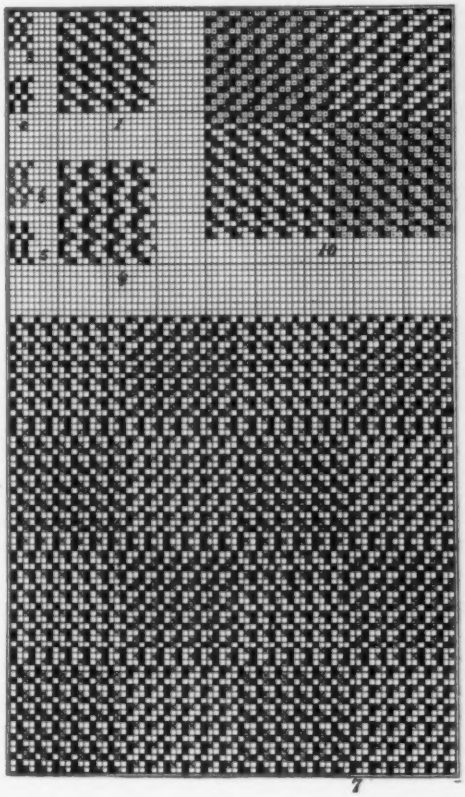
These are pile fabrics in which the pile threads are raised without the aid of wires. In their construction two systems of warp are used, a ground or solid warp and a loose or pile warp. Either warp comes from a separate beam from the fact that the pile warp will take up considerably more than the ground warp, as it is the said pile warp which has to form the characteristic loops on face and back of the structure.

These fabrics are made either on the harness or jacquard loom and we will in turn explain the manufacture of both kinds, although with reference to their structure, they are identical, the jacquard fabrics being simply a more elaborate affair compared to those made on the harness loom.

### HARNESS WORK.

For explaining the system of designing and constructing these fabrics as executed on the harness loom, the accompanying plate of weaves 1 to 10 is given.

Weave Fig. 1 shows the most commonly used weave for these fabrics, arranged for plain work in this instance. The reeding of the warp in connection with this weave can be either 2 or 4 threads in a dent, although it will be more advisable to use 2 ends. ■ type in said weave, and which is given in detail by itself as a weave in Fig. 2, refers to the ground or solid warp. ⊠ type in weave Fig. 1 indicates the loose or pile warp and which is shown by itself as a weave in diagram Fig. 3. It is this pile warp thread which, as mentioned before, produces the loops on face and back of the structure. Any time we find said pile warp to interlace $^{2}_{1}$ (see warp threads 2, 6, 10, etc.) said loops will be formed on the face of the



structure on account of the warp thread being, i.e., having previously to forming a loop, worked in the upper portion of the shed. Any time said pile warp threads interlace $_{2}^{1}$ (see warp threads 4, 8, 12, etc.) such warp threads will form loops on the back of the structure for the fact that such warp threads having previously to forming a loop, worked in the lower portion of the shed. If the reader will carefully study this subject he certainly cannot help but find at a glance the nature, i.e., the structure of these terry-pile fabrics. We call them terry-pile fabrics on account of the pile forming a loop, not cut, i.e., a terry loop.

Weave Fig. 4 shows a similar terry-pile weave, but not as much used as weave Fig. 1. In this instance the ground or solid warp is shown again by means of ■ type (see diagram Fig. 5 in detail for the weave). The pile warp is again shown by ⊠ type (see diagram 6 in detail for this weave). In connection with weave Fig. 4 the pile warp interlaces $^{3}_{1}$ for the loops on one side of the structure (see warp threads 2, 6, 10, etc.) and $_{3}^{1}$ for the loops as forming on the other side of the structure (see diagram 6 in detail for this weave).

With reference to comparing weave Fig. 1 to weave Fig. 4 we find that weave Fig. 1 will produce a better, more solid structure compared to weave Fig. 4, which will be more open in its interlacing, although for some higher textured fabrics weave Fig. 4 will be all right to use.

Having thus given a thorough explanation of the nature and construction of these terry-pile fabrics as used in connection with turkish towels, bath robes, etc., we now come to

### FANCY EFFECTS PRODUCED ON THE HARNESS LOOM.

In weave Fig. 7 we have shown each pile warp thread to form alternately loops on the face and on the back, exchanging in this procedure in the shape so as to form squares. Two threads of ground or solid warp (see ■ type) exchange with one end of pile warp (see ⊠) in one repeat of the dressing of the warp, the pile warp being arranged, as mentioned before, to alternately form loops in the shape of squares for motive (checker board effect) either on face or back of the structure. In this manner squares of pile loops will exchange with squares of "no loops" (common ground weaving), all over the fabric, face and back structure.

Going more in detail in examining this weave, Fig. 7, in the interest of the reader, we find that solid pile warp threads 3, 6, 9, 12, 15, 18, interlace for the first 18 picks $^{2}_{1}$, i.e., forming loops on the face of the structure. For the next 18 picks the same warp threads interlace $_{2}^{1}$, in turn forming loops on the back of the structure. Warp threads 21, 24, 27, 30, 33, 36, interlace with the filling just the reverse from the former set of pile warp threads, i.e., they weave for the first 18 picks $_{2}^{1}$ forming loops on the back of the structure, and for the next 18 picks they weave $^{2}_{1}$ in turn forming loops on the face of the structure. Whenever in the present weave these pile warp threads form loops on one side of the structure, as mentioned before, they interlace common (no loops) on the reverse side; forming in turn the characteristic effect "*loop*" or "*no loop*" in a certain portion of the structure on one side, the reverse being the case on the other side of said structure.

In the same manner as we thus have taken the "plain" motive, in connection with weave Fig. 7, we can substitute other motives for it, a feature which, after studying the previously given explanation, will readily explain itself to the reader. In order to make matters more plain to the student, the accompanying sketch, Fig. 8, of a fabric interlaced with weave Fig. 7

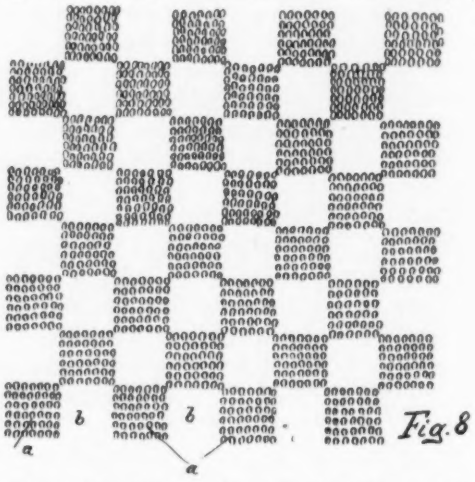


Fig. 8

is given, clearly showing at a, the places where the pile warp forms loops on the face of the fabric and at b, the places where the pile warp forms no loops, weaves plain, i.e., where loops are found on the back of the structure.

### USING TWO KINDS (COLORS) OF PILE WARP FOR FIGURING.

In this instance we will produce fabrics having loops all over the structure, on face as well as back; using two kinds, i.e., colors, of warp for the purpose of producing figures by

exchanging these two kinds of (colors) pile warps to work alternately on face or back of structure. By this we mean that when one color forms loops on the face of the structure, its mate pile warp thread (the other color) forms loops on the back of the structure and vice versa. Arranging this principle of exchanging colors after a given motive, will produce the design in the fabric.

For a clear understanding of the construction of these fabrics, the accompanying diagram, Fig. 9, and weave, Fig. 10, are given. Diagram Fig. 9 shows a fabric sketch of such a terry-pile fabric executed in two colors, one color being represented by loops executed in light lines (see a) the other color by loops shown in heavier lines (see b). For example, the heavy shaded squares (b) to represent red loops, the light shaded squares (a) to represent blue loops, it thus will be seen from sketch Fig. 9 that squares of red loops exchange with squares of blue loops after the plain motive.

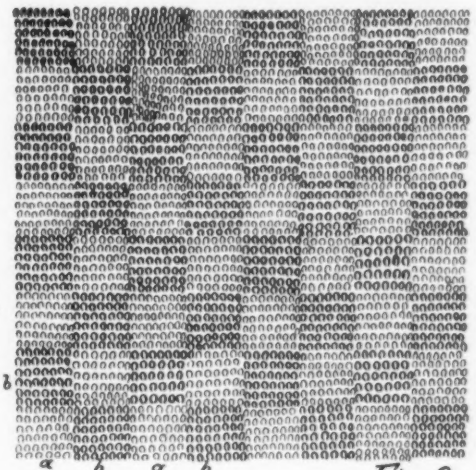



*Fig. 9*

Examining weave Fig. 10 we find 40 warp threads and 36 picks in the repeat of weave. Warp threads 1, 3, 5, 7, etc., i.e., every uneven number of warp threads (see ■ type), indicate ground or solid warp, which threads throughout the entire weave interlace alternately either $\frac{2}{1}$ or $\frac{1}{2}$. Warp threads 2, 4, 6, 8, 10 etc., i.e., every even warp thread refers to pile warp. The dressing in this instance to be done thus: Warp threads 2, 6, 10, 14, 18, 24, 28, 32, 36 and 40 to be of one color, say for example, red, being shown in our weave by means of ⊠ type. Every other pile warp thread i.e., warp threads 4, 8, 12, 16, 20, 22, 26, 30, 34 and 38 in the weave Fig. 10 to be of another color, say for example, blue (see ▣ type).

Examining the weave we will see that for the first 18 picks in the first five sets of pile warp threads, red warp pile (⊠) is up as said warp threads interlace $\frac{2}{1}$, the other pile warp threads (4, 8, 12, 16 and 20) being down, i.e., forming loops on the back of the structure at that time on account of interlacing $\frac{2}{1}$ (see ⧇ type). Examining the next 18 picks for said five sets of pile warp threads, we find that these threads interlace then with the filling just the opposite as done for the first 18 picks, i.e., the ⊠ type warp threads (red) as forming loops on the face of the fabric for the first 18 picks, form for the next 18 picks loops on the back of the structure and vice versa, and all the blue pile warp threads (see ⧇ type) as formed loops on the back of the structure for the first 18 picks of the weave form loops on the face of the structure for the next 18 picks. Warp threads 21 to 40 have their ground warp interlaced the same as the first 20 warp threads, however, their pile warp works just the reverse, i.e., where the ⊠ type threads (red) formed loops on the face of the fabric for the first 18 picks, then the type ⧇ warp threads (blue) form loops on the face of the structure. The next 18 picks are again just the reverse between these five sets of pile warp threads; in this way forming squares of loops of one kind (say, for example, red) to alternate with squares of loops of another color (say, for example, blue) on the face as well as the back of the structure, one color loops on one side of the structure carrying loops of the other color on the other side.

In the same manner as we have exchanged these two colors of loops, in connection with weave Fig. 10, after the plain motive, we can in turn use different motives, in this manner producing any number of fancy effects and this within compass of the harness loom.

Having thus given a thorough explanation of the construction of terry-pile fabrics as used in

connection with turkish towels, bath robes, etc., we now come to its application to

JACQUARD WORK.

Similar to harness work turkish towels, scarfs as well as bath robes can be constructed by means of the jacquard machine, the procedure of which is readily explained by means of the accompanying four illustrations of which Fig. 11 shows a sketch for such a fabric (greatly reduced in size). Fig. 12 shows a portion of the actual working design as prepared by the designer for practical work (being the left hand lower portion of fabric shown by sketch, Fig. 11). This working design as prepared by the designer for the loom, shows nothing but ground and figure effect (similar to damask fabrics executed with compound harnesses), no

Fig. 11.

weave is required to be introduced in the design. The construction of the fabric with reference to portion of weave shown in diagram, Fig. 11, is thus:

Figure effect (see ■ type) to be formed by means of loops on one side of the fabric, for example, face, showing regular weaving (the respective rib weave) on its opposite, i.e., reverse side.

Ground effect (see □ type) to form loops always on the opposite side, i.e., where ■ type forms loops on one side of the fabric, □ type forms loops on the other side and vice versa of the structure; consequently on one side of the fabric the figure appears in loops (raised) and the ground in regular weaving (depressed effect in the fabric), whereas on the other side

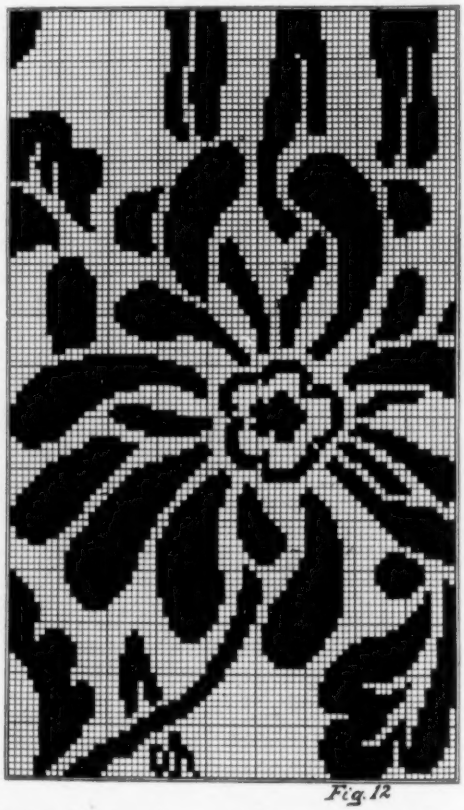


Fig. 12

of the fabric the ground appears in loops (raised) and the figure in regular weaving (depressed effect in the fabric).

We next have to turn our attention to

JACQUARD HARNESS MOUNTING

for these fabrics. Since it will be impossible for us to go with every different fabric structure back to the principles how to mount a jacquard harness and its relation to the machine and warp in loom, we refer the reader for this subject to E. A. Posselt's work on "The Jacquard Machine" which he can procure by

addressing the Textile World Record, and thus mention that there are three different ways of mounting the jacquard harness in connection with weaving these fabrics in use, viz:

First.—Using a two section tie up (see Figs.

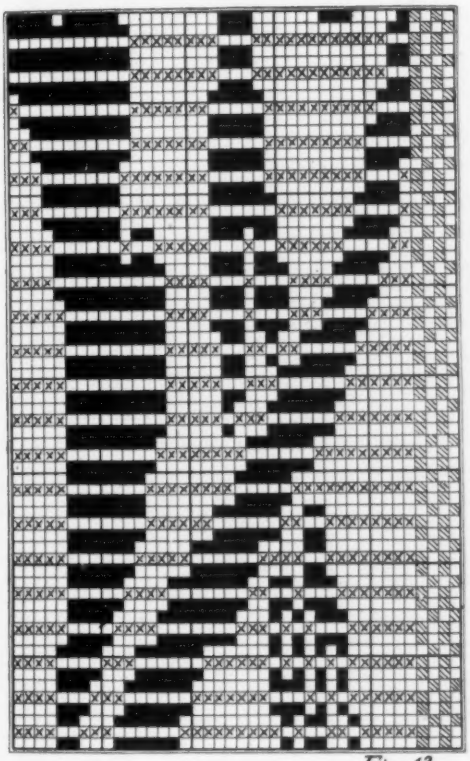


Fig. 13

LIV and LVI in the above work), using one section for the ground or solid warp and the other section for the pile or loose warp.

Second.—Using a single section straight through tie up (see Fig. XXX in the above work), using for the ground or solid warp hooks and needles 1, 3, 5, etc. (i.e., every uneven number of hook and needle) and for pile or loose warp hooks and needles 2, 4, 6, etc. (i.e., every even number of hook and needle). In connection with such a tie up the ground weave is cut for all the uneven numbered needles and the figure (as later on explained in detail) for all the even numbered needles.

Third.—Using two or four front harness for the ground or solid warp, in connection with a single section straight through tie up for the pile or loose warp.

HOW TO CUT CARDS FOR 2 SECTIONS.

For each pick (i.e., rows of squares filling ways) in the working design, cut three (3) cards thus:

■ type in Fig. 13 indicates "Figure up."

▨ type in Fig. 13 indicates "Ground up."

At the right hand side in Diagram Fig. 13 the weave for four threads of the ground warp (for first section) is shown by ▨ type.

Provided a design requires a large number of

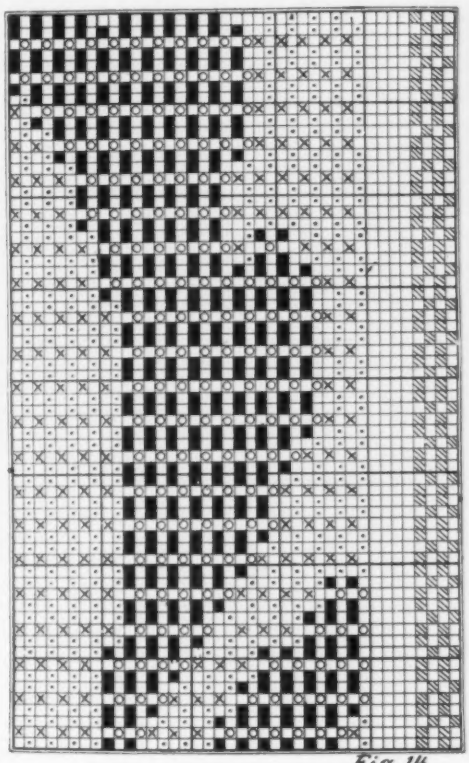


Fig. 14

needles for its execution we may use a larger portion of the needles the machine contains, for section 2, and fewer needles for section 1, arranging the tie up of the Jacquard harness accordingly, i.e., using correspondingly more harness for each leash in section 1 than to those in section 2.

In some instances figured fabrics showing loops all over the surface are produced in which

instance we must use a 3 section tie up for the mounting of the jacquard harness. The principle for this tie up is given by means of Fig. LIX of "The Jacquard Machine Analyzed and Explained." The principle of the structure of such a fabric has been given previously (for harness work) by means of Fig. 10 and its explanations.

The pile warp in this instance is used in two colors, drawn 1:1 and worked from one warp beam.

HOW TO CUT CARDS FOR A 3 SECTION TIE UP.

For each pick (i.e., rows of squares filling ways) in the design, cut 3 cards thus:

Diagram Fig. 13 illustrates this procedure i.e., shows how the cards are cut, and refers more particularly to the second section of the tie up, showing the lower left hand portion of the actual working design Fig. 12, i.e., its first 36 pile warp threads. 3 picks in Fig. 13 = 1 pick in Fig. 12.

Diagram Fig. 14 shows the analysis for the card stamping referred to—and more particularly refers to sections 2 and 3 of the tie up—referring to the first 16 rows of squares (from left hand lower corner) in working design Fig. 12.

At the right hand side in diagram Fig. 14, the weave for four threads of the ground warp (for first section) is shown by ▨ type.

In connection with Turkish towels, smooth end portions (without loops) are mostly required for which purpose cards have to be cut thus:

| | For First Section — Ground Warp. | For Second Section — Pile Warp. |
|---|---|---|
| First card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut ■ type in design. |
| Second card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut □ type in design. |
| Third card | Cut 2, 4, 6, 8, etc. (every even number needle) | Cut ■ type in design. |

| | For First Section — Ground Warp. | For Second Section — Pile Warp. Color No. 1. | For Third Section — Pile Warp. Color No. 2. |
|---|---|---|---|
| First Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut ■ type in design fig. 11. (see ■ type in analysis fig. 14 for it) | Cut □ type in design fig. 11. (see ⊡ type in analysis fig. 14 for it) |
| Second Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut □ type in design fig. 11. (see ▨ type in analysis fig. 14 for it) | Cut ■ type in design fig. 11. (see ▨ type in analysis fig. 14 for it) |
| Third Card | Cut 2, 4, 6, 8, etc. (every even number needle) | Cut ■ type in design fig. 11. (see ■ type in analysis fig. 14 for it) | Cut □ type in design fig. 11. (see ⊡ type in analysis fig. 14 for it) |

For Two Sections.

| | First Section — Ground Warp. | Second Section — Pile Warp. |
|---|---|---|
| First Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut 1, 3, 5, 7, etc. (every uneven number needle) |
| Second Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut 2, 4, 6, 8, etc. (every even number needle) |
| Third Card | Cut 2, 4, 6, 8, etc. (every even number needle) | Cut 1, 3, 5, 7, etc. (every uneven number needle) |

Using 3 cards to the repeat of pattern.

FOR THREE SECTIONS.

| | FIRST SECTION—GROUND WARP. | SECOND SECTION — PILE WARP. COLOR NO. 1. | THIRD SECTION—PILE WARP. COLOR NO. 2. |
|---|---|---|---|
| First Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | Cut solid. | |
| Second Card | Cut 1, 3, 5, 7, etc. (every uneven number needle) | | Cut solid. |
| Third Card | Cut 2, 4, 6, 8, etc. (every even number needle) | Cut solid. | |

Using also 3 cards to the repeat of pattern.

## STAFFORD'S NEW SHEDDING MOTION FOR DOBBIES.

The object of the new shedding motion is to produce a perfect shed in dobby looms, by having all the warp threads in the upper section of the shed in the same plane, from the fell of the cloth to the eyes of the needles, and also by having all of the warp threads of the bottom section of the shed in one plane, thus giving a clear shed in the same manner as if only two harnesses were used in the loom. The manner of construction and operation of the mechanism is best seen by referring to the accompanying illustrations of which Fig. 1 is a side elevation of a dobby showing part of the improvements, and Fig. 2 is a vertical section through the dobby showing more in detail its different parts for operating the harnesses. Referring to the figures, 1 indicates the rock shaft which carries a lever having upper and lower arms 2 and 3 respectively, and which arms vibrate back and forth with the rock shaft 1 as a centre, the motion which said arms receive being obtained from the loom through the lever rod 4 which is connected by a joint to the arm 5, said arm being centred on the rock shaft 1 and having a rigid connection with the levers 2-3, thus imparting the vibrating motion to them. It will be noticed that there are two levers centred on the rock shaft, i. e., the one on the front side of the dobby being indicated by 2-3, and the one on the back side of the dobby being indicated by 6-7, each arm of the latter lever being a little longer than the corresponding arms 2-3 of the front lever. Connected to the ends of the arms 2-3 are the rods 8 and 9 respectively, the other ends of which are connected to the front end of the top and bottom lifters 10 and 11 respectively. On the ends of the back arms 6 and 7 are connected rods 12 and 13 respectively which are longer than the rods 8 and 9. The other end of the rod 12 is connected to the top lifter 10, while the rod 13 is connected to the bottom lifter 11, hence the back ends of the lifters will receive a greater movement than their front ends.

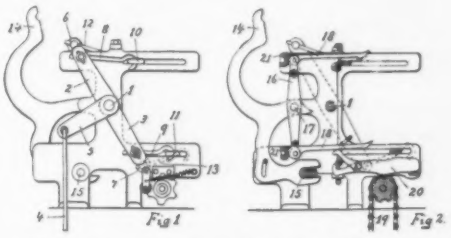


Fig 1 Fig 2.

The harness levers 14 are pivoted on the rod 15 at their lower ends and are connected at their middle projections to the connectors 16 by means of a joint 17, each end of the connectors 16 being jointed respectively to a hooked jack 18. These jacks are operated from the harness chain 19 through the levers 20, one of them resting under a lower hook while the adjacent lever has a wire resting on it which has its top end resting under the top hook of the same connector 16 as the bottom hook. From the leverage shown, it will be seen that when a peg or ball of the chain 19 comes under the lever 20, its other end is lowered and the hook jack 18, falls into the path of the vibrating lifter 10 or 11 according to which hook is operated,

and is carried outward by it. Through the connection previously referred to, the respective harness lever 14, is thus given a movement and by its connection with the harness (not shown) said harness is raised. As was stated, the object of the motion is to have all the threads of each section of the shed in one plane, and this object is accomplished for the top shed by having the levers for operating the lifters 10 and 11 of different length, as described, for the reason that the back end of the lifters, by being connected to the longer levers, will move through a greater distance than the front ends of said lifters and hence the hooked jacks 18 which are situated toward the back of the dobby will get a longer pull and through their connection with the harness levers 14, will give a correspondingly increased movement to them. It will be readily understood that each successive harness lever, as they approach the front of the dobby, will receive a slightly less upward movement than the harness lever just back of it. In this manner all of the threads in the top section of the shed are brought into one plane, thus obtaining half of the object of the improvement. The other half, that is getting all of the threads of the bottom section of the shed in one plane, is accomplished by setting the lower pivot 15, at a horizontal angle, thus having the back end of said pivot farther away from the harnesses than the front end. The positions of the stop bars 21, being parallel to the loom side, when the hooked jacks are free the connectors 16, are vertical and the pivots 17, are in a straight line. Owing to the horizontal inclination of the pivot 15, the lower end of the last harness lever 14, is farther away from the harnesses than the lower end of the first harness lever, and consequently its top end to which the harness straps are connected is closer to the harnesses and thus the harness itself is lower than the harness which is connected to the first harness lever. The top of each successive harness lever is a little higher than the one just back of it, and in this manner all the warp threads in the bottom section of the shed are brought into one plane. The bottom pivot 15, does not necessarily have to be a circular bar, and in its stead a cast bar, having a horizontally inclined edge, may be used to advantage, as it is claimed that less wear of the bar results, owing to its hardness in being cast.

## POINTS ON PICKING AND SCUTCHING WITH CALCULATIONS FOR THE PREPARATORY DEPARTMENT OF A COTTON MILL.

The fact that impurities, which are always present in more or less quantities in the cotton, caused by careless picking the cotton in the field or handling at the gin, are being extracted more in the preparatory processes now than ever before, is a good indication of the careful study which has been made relative to that department of a cotton spinning mill and the results obtained, that is, extracting impurities, have been most beneficial to the after processes of carding, combing, drawing, roving and spinning, as the heavy work once required of them is now reduced to a minimum.

The cotton, as taken from the bale, is in most cases at the present day made to travel in a loose condition a distance varying from 50 to 400 feet, depending on the convenience of opening the bales. It generally falls to the floor of the room convenient for feeding by hand to the hopper feeder or in some cases fed or conveyed direct to a hopper feed. As it is blown through the pipes by an air current, in its passage the cotton naturally is loosened up by the action of the air current and also by its rolling movement through the pipes.

A two fold advantage is thus derived from this system, viz., the cotton is brought to the hopper feed in a more or less loose condition, which of course will give a more uniform feed through that machine, as there are no lumps of the bale to interfere with correct feeding, as is often the case where such a system is not used.

The loose condition of the cotton also facilitates cleaning, as the impurities, being heavier than the cotton, can more readily sift out of the material.

As stated before, the loose condition of

the cotton tends to make a more even feed through the hopper feed, but it must be remembered that part of this good effect is lost if the hopper is not properly fed as to quantity. Fig. 1 is a section through the hopper feeder as built by the Kitson Machine Co., showing clearly the relation of the parts to each other. In the same A indicates the chamber, the bottom of which is formed by an endless lattice apron B on which the cotton as deposited by hand rests, and whereby the same is constantly urged against the spiked vertical lattice apron C, which is traveling upwards, driven by a roller D at the top, specially made to avoid slipping. The apron C is supported at intervals, on its

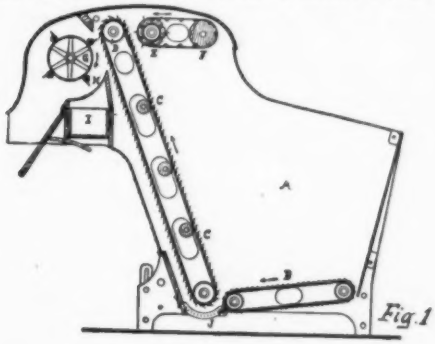


Fig. 1

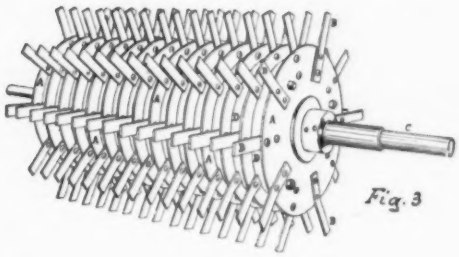


Fig. 3

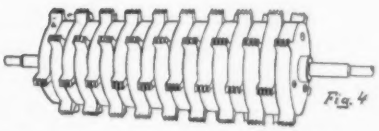
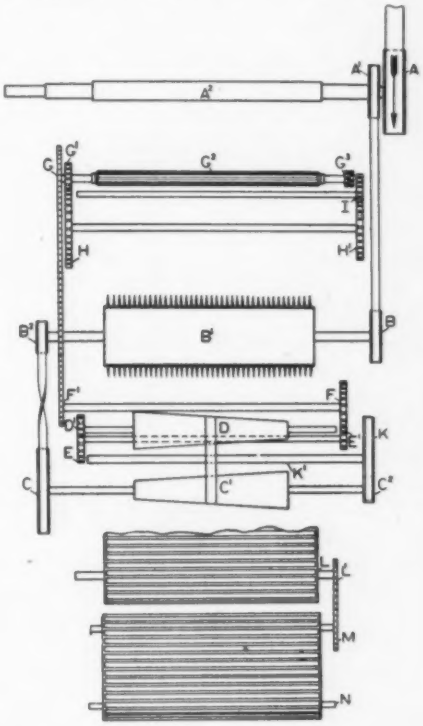


Fig. 4

elevating side, by carrier rolls, in order to render a straight, steady surface to the cotton, and consists of a heavy canvas belt, backed with leather strips, fastened to which are wooden slats, from which project pins by which the cotton is caught and carried upwards. The spiked lattice C, having passed the driving roller D at the top of the machine, the spikes are naturally pointing downwards, and the cotton is then easily removed from it by the stripper or doffer roller G, as is driven from a countershaft. As the doffer G runs at a considerable high speed as compared to the slow speed of the feeding apron C, a continuous series of blows are given by the flaps to the cotton as on the feeding apron, by means of which the cotton is stripped or beaten from the pins and



thrown against a screen or grid H directly beneath the doffer, through which any loose dirt will fall. Beneath this screen is a dirt drawer I, which receives dust and dirt that is beaten out of the cotton by the doffer. A screen J as placed beneath the spiked lattice C permits impurities falling from the latter to drop out of the machine, the screen being arranged so that it can be readily dropped and accumulated dirt removed when necessary.

The chamber of the hopper feed should never be piled up with cotton so that it can hold no more and should not be left so long without replenishing that the bottom is

merely covered, as in the first case, the feed will be excessive, while in the latter it will be insufficient; a good average is to keep the hopper about as nearly as possible from three-quarters to four-fifths full supplied with cotton. There are two possible methods of regulating the feed of the hopper feeder, viz., by the position of the spiked rail around which the leather apron travels, in relation to the elevating spiked apron, and also the speed of the elevating apron itself. The former method is the one generally adopted. The closer the spiked roll is to the elevating apron, the more cotton will be cleared off of it, and hence a diminished feed, whereas when the spiked roll is moved further away from the elevating apron, more cotton remains on the apron, and hence the feed is increased. In order to facilitate a rapid and accurate change in the position of the spiked roll, scales are placed on either side of the machine at the point where the movable framing for the roll rests upon the sides of the hopper, and by setting the notches on each side of the movable frame over the same number on each scale, the roll is brought parallel with the apron. The second method is performed by means of a pair of cone pulleys, the belt being run along them with a shipper and belt guide.

The leather apron which fits on the spiked roll E, has for its object to brush the surplus cotton from said spiked roll, which it has cleared from the elevating apron C, thus preventing it from sticking to the spikes and clogging them up. It should always be kept tight, as any slack in it might offer an opportunity for injury by the spikes of the roll. The surface speed of the spiked roll should be a little in excess of the elevating apron, although an equal speed is admissable, but never a less surface speed for the spiked roll; as the cotton would collect in a heap at the point of contact of the two and thus cause trouble.

The cotton is removed, as stated before, from the elevating apron C, just after said apron goes over the top roll D which supports it, by means of doffer G which has four strips of leather set equidistant around its circumference and extending the width of the doffer. They are parallel to the apron and as the doffer revolves, act to brush the cotton off of the spikes. The cotton on being brushed off of the elevating apron passes over the dust bars and down through an opening, ready to be taken to the picker.

A method sometimes adopted is to have the hopper feeder connected directly to the picker which results in a great saving in floor space. Fig. 2 is a plan of a directly connected hopper feeder with a picker as built by the Howard & Bullough, American Machine Co. In order to regulate the feed of the machine, to compensate for the necessary change in amount of material at one time in the hopper, and which would influence the amount of feed of the machine, a cone regulator is applied, which controls the amount of cotton delivered by the hopper feed regardless whether the hopper is full, half full or nearly empty. The cotton in this instance when leaving the hopper feed, is made to pass between two evener rollers, the bearing of the one being fixed, and that of the other being movable in a horizontal slot. The bearing of the latter rests against the short arm of a lever, of which the long arm is in connection with the strap fork in the cone box, and thus by suitable connections modifies the speed of the spiked lattice according to the thickness of the cotton passing between the evener rollers mentioned before. The feed to the picker is regulated in unison with the spiked lattice of the hopper feed, so that when the quantity of cotton in the hopper diminishes, the lattice of the hopper feed and also the feed rolls of the picker correspondingly increase in speed, the quantity of cotton delivered to the action of the beater thus remaining the same. In addition to the variation of the speed of the spiked lattice obtainable from the cones, and to that of the feed obtainable by advancing or withdrawing the spiked roller, the fundamental speed of the spiked lattice can be altered by change wheels; the object of varying the speed a great deal depending upon the class and condition of the cotton under operation, the more hard and matted the cotton as presented to the feeder, the slower the speed of the lattice required to obtain a given weight of feed.

(To be continued.)

# CORRESPONDENCE AND NOTES

## Upon Textile Topics at Home and Abroad.

### WOOLEN MANUFACTURING IN NOVA SCOTIA.

*BY AN OBSERVER.*

The writer has recently had an experience in woolen manufacturing in Nova Scotia, and thinks an account of the conditions prevailing there would be of interest to the readers of the Textile World Record.

The farmers of Nova Scotia go in for mixed farming, and generally keep from six to twelve sheep. The wool is of various qualities. The Leicester is a favorite breed, as it is hardy, and gives a heavy carcass and fleece. The Southdown generally sickens with a severe cold in its sixth year, though this should not weigh with the farmer as a sheep should not be kept so long anyway, the meat and fleece both deteriorating as the sheep gets old. Probably the extra weight of the Leicester means more food consumed; it is a bony sheep and the mutton is inferior to that of the short wool variety. I think the farmer is making a mistake in growing Leicesters and cross bred sheep.

When the wool is sheared, the farmer's family turn to and wash it. This is done in tubs, probably those used for the family washing. It is usually fairly well done, but as the particular method employed depends on the idiosyncrasies of the farmer's wife, the results vary considerably.

The wool is tied in sheets, counterpanes, or anything that comes handy, and taken to the nearest mill, where it is sold or exchanged for cloth. If no mill is within reach, it is exchanged at the general store for groceries, dry goods, or anything else required.

The manufacturers meet yearly and settle the price to be paid for wool for the ensuing year. This is now 16 cents; if they take cloth instead of cash they are paid at the rate of 20 cents per pound for the wool. When the wool is very inferior, the farmer is generally allowed the usual price for the wool, but charged extra for the cloth. The farmer brings in from 60 to 120 lbs. of wool each season, the storekeepers sell in larger quantities, some of them can send in as much as 10 tons at a time, the price is the same as to the farmer, and the mill pays the carriage in most cases.

Unwashed wool is rarely seen, as the price is two-thirds of that paid for tub washed wool; the farmer does not count the loss in weight in scouring, and thinks that he is being robbed, whereas he would be better off if he sold it greasy, as, in addition to the extra weight, he would save soap, fuel and labor. I never saw any unwashed wool while there, so cannot form any opinion as to the percentage of loss.

The wool is not sorted, except for fine yarn and single for twist; the worst locks will be picked out as the wool is being thrown into the dyetub, and some may be taken out in feeding the mixing picker, but this is all that will be done for most of the stuff.

The wool is dyed without any washing, other than that given it by the farmer's wife. The result is that uneven dyeing is the rule, not the exception. This is of little consequence in the cheviots they make, as almost all the yarns used are mixtures, and the customers are not at all particular about the pieces matching the samples or each other.

Most of the yarn used is about 1 1/2 run; the wool being coarse and open does not need much carding, and the yarn is generally even, having been carded really more than is necessary in passing through three ordinary cards. It has to be well twisted for warp and is then a very good yarn of its class. As far as I have been able to learn, none of the

mills use a burr picker, and this, combined with the gummy state of some of the wool from bad washing makes it very difficult to keep the card clothing in good order.

The most used yarn is the 1 1/2 run; then comes the 2 1/2 run single for twist. With the exception of a few Summer cloths, the ends and picks vary between 26 and 32, and the same price is paid for weaving; 28 by 28, 66 inches wide in the loom is a favorite set, though there is a variation both ways in different mills. Designing is mostly on old lines: 1 black, 1 gray, in both warp and weft; 2 black, 2 grey or fancy, wefted black or as warped; 4 black, 4 grey, wefted same or black; 4 black, 4 grey, 2 black, 2 grey, wefted same; and similar simple designs. Black with grey, brown or bronze or green mixtures are popular shades. These made 22 oz. will fetch $1.10, if the fancy yarn is a twist, the weight is about 24 ounces per yard, and the price is $1.25. A favorite cloth with the farmers is made 1 white and brown twist, 1 white and yellow twist wefted as warped. This makes a dirty looking color that can be dragged across a farm yard without it showing bad stains. A variety of shades are made in this cloth, green and bronze mixtures being used with white in the twist yarns. This cloth will weigh 26 to 27 ounces and will sell for $1.35 per 6/4 yard. If with black weft, the weight will be about 24 ounces and the price $1.25 per 6/4 yard.

The coarse wool that has been picked out is spun to about 1 run and is used as weft on a black cotton warp, and sells freely for lumbermen's pants. It is woven with a 4-harness herringbone. This will weigh about 19 ounces and sells for 70 cents. These figures are quoted 6/4 width, but most of the stuff is made in 3/4 width as the trade, and especially the farmers, prefer it, because they can cut the narrower pieces on the kitchen table, whereas 6/4 goods must be spread on the floor.

The designs mentioned sell year after year, so but little designing is done. For the Summer season, a few homespuns and wool crashes are made in some of the mills, also some ladies' stuff, but most of the trade is on the same patterns and fabric all the year round.

It must be understood that the Nova Scotia wool will not spin to 3 run, so that it is usual to use 2 1/2 run for twist, making a yarn equivalent to 1 1/4 to use with the single 1 1/2, thus the cloths made with the same pitch with twist yarns will weigh more and fetch a higher price. Wages in Nova Scotia are low; $20 a month is a fair wage for learners and well grown lads, while for $1.25 a day you can obtain a millman, warper, or loom fixer. Foremen get around $2 a day. As can readily be seen from these figures, there is a handsome profit on woolen manufacturing in Nova Scotia, the smallness of the trade is the factor that prevents a large extension of the industry there. The present rapid increase in the population is a factor that will count for much in the near future.

## MEMOIRS OF A VETERN MASTER MECHANIC.

*BY EBEN GOULD.*

(Continued from the January Textile World.)

At the time Mr. Strong took charge of the mill the piping of the dyetubs in the dyehouse had become old and the joints were eaten away so that many of them leaked. There was no way to repair them except with new pipe and fittings and several weeks before I had handed into the office a list of what was needed to do that job. One day Mr. Strong came and said he wanted to see me at the dyehouse when he came back from dinner. We had never been there together before and he began at the engine and went all about the machinery and finally came to the dyetubs. He looked up at the leak of steam as if he had seen it for the first time and said:

"There seems to be a leak."

"Yes," I said, "I see there is."

"That should be stopped."

"Yes, I know it should."

Then after talking of other things for awhile he pointed to another leak and said:

"That must be stopped."

"I know it," was my reply.

He pointed out several other leaks and the word "must" came out more distinct every time. Finally he stopped and then I asked him if that was all. He wanted to know if it wasn't enough. "Yes," I said, "and if you have got through I have a word to say. Now, Mr. Strong, in your remarks about those leaks you have used the word 'must' quite frequently, but I shall use it but once. On your desk in the office is an order for pipe and fittings that has never been attended to; now whenever I put in an order for supplies they must come," and I am sure my word must was fully as distinct as any of his had been.

"Oh," he says, "this don't need new pipe. All it wants is a pair of tongs to just tighten up those joints."

I had to laugh and said, "That pipe is old and the threads are all eaten through and can only be repaired by putting on new ones, and that order on your desk is for this very work. If you had ordered it you would not have had occasion to call my attention to those leaks."

A few days later the new pipe came and the leaks were stopped. I have always thought that Johnny Peep did all he could to set Mr. Strong against me. We never had any words but he did not seem to be suited with me so one day I told him if he was not satisfied with me or if there was any one else he wanted to put in my place, the sooner he did it the better. This seemed to please him and from that time on we were the best of friends. I stayed with him till the first of March, 1869, then I went to Hyde Park for about a year then back to Dedham to put on a self operating jack head, then to Boston to set some boilers and engines and put up shafting in J. F. Paul's Mill on Albany Street. I was there about two years and then went back to the Merchant's Mills in Dedham. A few weeks ago I made a visit to the J. F. Paul Mills and found the engine and shafting I set up running as well as when it first started.

Before I left Mr. Strong he hired a man to take my place as master mechanic and engineer and told me he did not want me to go until the new man was "waywised" and used to the place. I told him I would stay a few days if the new man wanted me to.

After the new man came I soon found out that he was no machinist and knew nothing about a steam engine or boiler, and instead of coming alone he had a foreman for the machine shop and an engineer for the engines and boilers, making three men to fill my place. I took the new foreman around and introduced him to all the different hands in the repair shop and the engine and boiler rooms, and told them he was their foreman and that they were to obey his orders as they had heretofore obeyed mine. It was soon quite evident to me that he was not just the man to fill such a place. He was a good carpenter but he knew next to nothing about iron or steam works.

During the first week he seemed quite anxious that the engineer should find something to do, and Saturday he came to me and said he found a small leak in one of the flange pipes over No. 2 boiler and he wanted his engineer to put in a new packing Sunday.

I said, "Very well, I'll see that the boiler is blown off so that he can have it as early as he likes."

I sent for the young man who was engineer over the engine and boiler and in the presence of the new boss I says to him, "Henry, have boiler No. 2 blown off tonight so that the pipe can be packed tomorrow." The lad started back to his engine and the new boss said to me: "Will he do it? Will he blow off the steam?"

"Of course he will. Didn't you hear me tell him what to do? My men always do as I tell them."

A few minutes after shutting down the boy came into the shop and said the new boss had told him to blow off that boiler at once and the fireman had already drawn the fires. He said he had told the watchman what boilers to blow and I told him to go home and not do anything more about it.

As I was leaving the mill I heard the steam blowing off. I didn't go near the boiler house but I couldn't help thinking what a fix that boss would be in when they fired up Monday morning, and it was as bad as I

expected, for the brick work was so hot at the time of the blowing off that the boiler expanded so much as to start the tubes and 18 of them were leaking very badly.

The new boss was in a terrible fret and came to me to see what could be done about it. I had a lot of brushings on hand ready to use in case of a leaky tube and thinking how cut up the man would feel to have it known that part of the works would have to be stopped a day for his blunder, I went to work and put in those eighteen leak stoppers with the fires going and steam all up. I got my arms and hands pretty well blistered but stopped all the leaks.

When I got back to the shop the new man came and says, "It makes mischief to put cold water into a boiler."

"It does no harm to put cold water into a cold boiler."

"Well, what did make all them tubes leak?"

"When I was going home Saturday," I said, "I heard the steam blowing from that boiler and the boiler was so hot that the expansion started the tubes from the front head of the boiler."

"Well," he said, "I don't know how it came to be blowed off at that time. I didn't order it."

Now, I knew he was in the fire room at the time and I knew I had neither an engineer nor a fireman that would have done such a thing. I didn't say any more, but I went to the engine room to see Henry.

"I thought you said the new boss told you to blow off No. 2 as soon as you stopped the engine."

"That's just what he did say, and I told him the watchman would blow off the steam at the right time, but he told me to blow it off then."

Then I went to the fireman and said, "Bill, did you blow off No. 2 Saturday?"

"Yes."

"Didn't you know better than that?"

"Oh, yes, I knew better, but you told me to obey the orders of the new man. I told him you never had them blown off until after ten o'clock at night, but he said he didn't care what you wanted, he was going to have it his way, so I blowed it off just as he said."

"You did right, he is your boss, but he told me he didn't order it done."

Now my way of blowing off the boilers had always been to draw the fires, then leave the furnace doors and the draft dampers open to let the cold air through so as to cool the brick work, letting them stand at least six hours before blowing off and then twenty-four hours more before filling with water; in that way I never caused a leak by blowing off a boiler, but this new man had the boilers filled with cold water just as soon as they stopped blowing off.

What looked the worst to me was that the new man should deny having caused the trouble after I had scalded my hands and arms trying to get him out of the scrape. I stayed about six weeks after the new man came and then left against the wishes of both the owners and the agent, but I couldn't see the need of two foremen in one shop.

I went to Hyde Park and did jobbing work for about two years. When I was there a wood working mill in the town burned down. The engine that furnished the power was in a small brick building adjacent to the wooden building that contained the machinery. The wooden building was entirely destroyed, the engine and boiler house unroofed. The engine and boiler were damaged but very little, but the shafting was beyond repair. Several days after the owner came and asked if I would go with him and see if I could put the engine into running order. I went and looked it over and told him it could all be put into good order except the water heater; that would have to be replaced by a new one.

I went to work on it and while the carpenters were putting up a new building and repairing the roof of the engine house, I fixed up the engine, put in new heaters, helped put up the shafting and when everything was ready started the works. The owner said it ran better than it ever did before and did more work, but I have yet to learn where the benefit to me came in as I have never yet seen a single dollar for all my work in setting the mill to work. The owner was an entire stranger to me and passed on many years ago and I am still out on that repair job.

While I was in Hyde Park I did quite a number of jobs for the agent of the woolen mill and soon discovered that he had the knack of mixing different qualities of stock and making them into good salable goods better than any other mill superintendent I had ever seen.

One day I had occasion to go up into the attic of the mill and there I saw a very good shear grinder for grinding the revolvers and ledger blades to the cloth shearing machines. I had noticed while passing through the finishing room that the shearing machines were badly out of tone and needed grinding, and when the owner came into the shop I asked him why he did not have the shears ground and not have them make such a noise. He said it was so expensive to send them away that they used them as long as they could. I told him I didn't see why they should be sent away when there was a good grinder in the attic of the mill. He said it was not good for anything and they couldn't do anything with it. But I told him I had done the shear grinding in the Merchant's mills for a number of years and their grinder was not half as good as the one up in the attic, and if he would have it brought down to the shop I would soon show him that there was no occasion to have the shears sent away.

Before night the grinder was set up in the shop and a revolver was being ground. The boss finisher did not know how to grind his shear and was well pleased to find somebody that could show him how to do it. When the first shear was done and we started shearing a piece of cloth he was pleased to see that it made hardly any noise, while before it could be heard all over the finishing room. Pretty soon the owner came in and looked at it and said to the boss finisher:

"Well, Sam, it is a pretty good thing for you to have some one come in to grind your shears for you."

Sam was an Englishman and in no mood just then to have all the benefits put on him so he snapped out:

"It is a pretty good thing for you too, is it not?"

(To be continued.)

## THE DETERIORATION OF COTTON.

*DR. A. S. HEATH.*

Is such deterioration unavoidable? In the light of modern agriculture it surely is not.

First. The vegetable textile requires the most intelligent and practical tillage and management and farming. Tillage means the proper cultivation of the soil; manage1 ent, everything essential to soil and seed; farming means the judicious planting, care and harvesting of the crop or crops grown. If the soil is poor in crop food, no tiller can insure good and plentiful crops. And if the seed is poor no matter how rich the soil the crop must needs be defective and deficient. Moreover, the crop must be properly harvested and cared for no matter how perfect the previous conditions.

The Seed. The best and the most perfect of the earliest maturing seed is that which in rich soil well tilled yields the most cotton, superior in fineness, length and strength. It is as necessary to have good seed as to have good blood from which to breed up our domestic animals to the fully required demands of their products, milk, meat, labor, speed, health, or any other demand.

When the cotton growers cease to sell the finest and most perfect cotton seed to be converted into oil and meal and save it for planting on well fertilized and well tilled land, and rotate the crops so that the cotton fibre plant food does not become starved out or exhausted, then instead of decreasing in the qualities needed, the betterment of the cotton crops will be assured.

The improvement of agriculture from year to year vastly ameliorates the conditions of mankind in all of the necessaries as well as the more uniform supplies of the luxuries, which by habit and custom have also become necessitous. The cheapening of the products of the farm by increasing the annual production enlarges the consumption, thus lending hopefulness to industries.

The deficiency in acreage of cotton planted does not account for the quality of the lint, nor indeed does it wholly or even in part account for falling off of the average number of bales produced. But like the decrease of

bushels per acre of the wheat crop of the United States, it does not so much depend upon the low fertilization of the soil with cotton as it does with the vital drain, or the lack, of virile seed used. Mature seed of the best quality largely adds to the quantity and quality of the cereal crops, but the seed of the cotton crop seems to demand especial excellence for the yield per acre in quantity and quality. Unless due regard be given to a better quality of cotton seed, to more generous fertilization of the soil and better tillage, depreciation in our cotton crops must lesson in amount and quality year by year. As in breeding live stock, like produces like, and the penalty of violating this inexorable law of nature brings its sure penalty in both the animal and vegetable kingdoms.

## THE SIZING AND FINISHING OF COTTON TEXTILES.

*BETA-NAPHTHOL.*

The practice of "sizing" cotton threads preparatory to weaving them into cloth dates from a very early period in the history of textile manufactures, but it probably originated by the weaver applying some substance to the threads that would tend to lay the loose fibres against the main thread body, thereby materially facilitating the weaving by preventing these fibres working up into a tuft, and thus causing the yarn to break.

Finishing as is now generally practiced, is not confined wholly to cotton goods, but finds wide application in many other classes of goods, but the present paper will deal only with the finishing of cotton, or cotton and wool or silk goods, one side of which is cotton.

The object of finishing is to improve the appearance and handle of the pieces, and requires considerable skill and judgment in order to produce high class results.

A properly prepared size or finishing paste contains five ingredients, each of which is added for the purpose of obtaining some definite result, so that the final piece of goods has a certain merchantable value imparted to it. Of course, it is possible that such pastes may be prepared, and no doubt are quite frequently made with fewer ingredients, but it is just here that the size maker's knowledge of the case in hand plays an important part in knowing what to put in the mixture and what to leave out.

In the first place, there are a few simple instructions of a general character that should be closely observed in the compounding of size pastes, irrespective of the uses to which they are put, whether warps or piece goods. They are based upon the nature of the ingredients, as the quality of the resulting size will depend upon the order in which the compounds are added. These instructions are as follows:—

The finished paste must be thoroughly smooth and homogenous, devoid of any lumps or particles of unconverted paste forming materials. To secure this important condition, it is usually necessary to cause the paste to be strained or passed through a fine hair cloth or wire sieve. As this condition is further facilitated by mixing, it will be found most desirable to have a suitable appliance for this purpose, as shown in Figure 1, consisting of a wooden tub of convenient size, heated by an internal coil of steam pipes, and provided with a pair of radial arms from which, extending downwards, is a series of paddles, which, when in motion, cause a thorough mixing and incorporation of the several ingredients.

For the preparation of large quantities of sizes or finishes it will be found most economical to "dissolve" the starches or gums used in a separate vat or tub, and to run off from this to the mixing tank such quantities as may be necessary to make a batch of finisher size. But, of course, for small quantities, say up to one hundred gallons, clean casks may be used to good advantage, excepting that the labor of mixing is very great and rather fatiguing to the laborer, while the risk of his being occasionally scalded by the hot paste must also be taken into account.

As few pastes can be used to good advantage when cold, it is essential that the storage tub be provided with a steam pipe for use, especially in winter, to keep the contents from chilling. Size or finish, when once chilled, does not work as well as size that has been kept warm.

The various ingredients used in the preparation of sizes are grouped as follows: 1—Stiffening or body agents; 2—Lustring agents; 3—Softeners; 4—Preservatives; 5—Coloring matters; 6—Leading materials.

Each one of these groups may be treated separately to good advantage, and incidentally, outline the proper method of using each most economically.

STIFFENING AGENTS.

These include the various commercial starches, corn, wheat, potato, sago, and rice being the most important for finishing purposes; others are sometimes used, but they offer absolutely no advantage over the above. Perhaps corn starch is used more than any of the others, although sago occupies a prominent place.

Next to the starches proper, flour is much used, especially for plain warp sizing, and is also used for some piece goods finishes. What are known as the dextrines—converted starches—find very wide application in sizing, etc., as by their use a peculiarly crisp and elastic handle is imparted to the goods, and yet quite free from any brittleness. Dextrine or British gum does not yield the same degree of harshness to piece goods as plain starch.

Irish moss, or carraigeen, a seaweed, is much used in conjunction with starches as a means of mellowing the harshness of the latter, but it is seldom used alone.

For the production of stiff pastes, the size maker has recourse to the gums, of which he has a variety to select from, the most important being gum tragacanth and gum arabic, for sizing purposes, both are used always when mixed with starches.

To impart great stiffness to goods, the use of one or more of the several grades of glue is resorted to, but as a small proportion is quite sufficient to yield excellent results, its use should be attempted only after some experiments have been made.

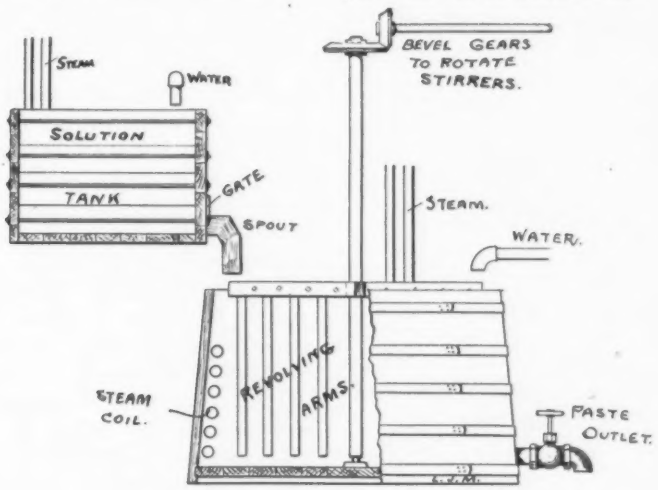



FIG. I.

LUSTRING AGENTS.

In finishing many classes of goods, it is desirable that they should possess lustre or sheen, to impart which certain substances must be added to the paste in small quantity that will have no material influence on the size or finish proper, but yet which will give the desired results. The most important substance adapted to this purpose is paraffine wax, and following in order may be mentioned: tallow, stearine, beeswax, and various kinds of soaps. Some oils, notably palm nut oil, cocoanut oil, and spermaceti are also used, but the writer thinks that by properly incorporating paraffine wax, the most satisfactory results will be secured.

Paraffine wax is odorless, absolutely non-injurious to either fibres, colors or any ingredient that might be used. It is clean and easy to melt. Its use entails no risks, and what is of some importance, it is

always uniform in quality—reference being had to the white paraffine-wax. Besides imparting a gloss to the fabrics when they pass over the bright cans of the machine, the wax also prevents the fabric from sticking. Owing to its odorless qualities, the manufacturer is freed from the annoyance usually attached to the purchase of the various grades of tallows which will always betray their presence in many goods owing to their use in finishing.

In using a size containing a wax, fat, or oil that is solid at ordinary temperature, care must be taken that the working temperature be not allowed to go lower than that of the melting point of the respective softener used. The following are the lowest temperatures that are practically allowable: Paraffine wax, 140° F.; beeswax, 150° F.; tallow, 125° F.; cocoanut oil, 90° F.; palm oil, 100° F.; spermaceti, 125° F.

### SOFTENERS.

In the manufacture of a size or finishing paste, if some substance is not added to impart pliability to the goods they would be unmerchantable, consequently certain substances must be incorporated that will produce this result, and at the same time have no action or influence on the other ingredients or the material being finished. Those substances best known are soaps, but as they may only be used in plain sizes, their use is limited, for the reason that they decompose and form spots should any metallic salt be present.

The most generally useful softener is glycerine. This is quite inert, having no injurious action on other ingredients or goods, while, when used in reasonable proportions, imparts a rich and desirable feel or handle to the goods. Certain metallic salts are used for the same purpose, viz., the chlorides of calcium and of magnesium; chloride of zinc is used to a considerable extent, also, but it cannot be wholly recommended.

In recent years much use has been made of the so-called soluble or sulphated oils, and with excellent results. As ordinarily sold they are entirely soluble in water and are free from odor or other injurious action. It is urged upon size makers to insist upon a guarantee from the seller of such oils that they are made from castor oil only, and containing not less than fifty per cent. of such oil in the finished article. There are many grades upon the market, each having its own fanciful name. As a softener for size or finishes a good article has no superior.

### PRESERVATIVES.

If sizes or finishes are made and applied to goods without the use of some kind of preservative or antiseptic there will be a liability of mildew setting in, and much loss entailed. To obviate this possibility, the size maker must incorporate with the mixture certain substances that will prevent the development of these objectionable fungus growths.

The very best known preservatives are salicylic acid, carbolic acid (phenol), borax, and certain metallic salts, including the chlorides of zinc, barium, and sodium (common salt) and sulphate of zinc. For most purposes, however, salicylic acid is employed and is prized for its general good qualities. Only small quantities are necessary to give the best results.

Formaldehyde is used to some small extent, but it has not gained any very great hold upon the size maker; its chief defects are volability and penetrative odor.

### COLORING MATTERS.

Depending upon the use to which the sized or finished goods are to be put will determine whether the paste is to be left uncolored, tinted or heavily colored. Blue is the principal tinting color used, as it is chiefly employed for the purpose of "whitening" the sized material. For most purposes of color-sizing cotton goods, the basic dyes are used, which include the following well known materials: Fuchsines and Safranines, Methyl Violets, Phosphines, Chrysoidines and Bismarck Browns, Brilliant and Malachite Greens, Auramine, Soluble Blue, Cotton Blue, etc.

### LOADING MATERIALS.

These are added to some finishing pastes for the purpose of increasing the weight of the finished goods. The practice of such weighting has its supporters and objectors,

and it is not the purpose of the present article to refer to either side.

As a loading material, there may be used china or "pipe" clay; powdered soapstone or talc; terra alba or sulphate of calcium (ground native gypsum); Epsom salts or sulphate of magnesia, Barytes, and Glauber's salt.

Of course, the nature and class of goods, their ultimate uses and cost will materially decide just how much loading they will stand.

PREPARATION OF SIZES.

The starch to be used is weighed and mixed with sufficient cold water so that a medium thin cream will be formed. When a good mixture is formed and no lumps remain, the remaining quantity of water is added, and heat applied, being gradually increased with constant stirring until a thoroughly uniform paste is formed, which will occur after the entire mass has boiled for about ten or fifteen minutes.

This base or stock is then used to build the final finish by the proper addition of suitable ingredients as previously described and in the following order: The softener, glycerine or sulphated oil, followed by the lustring agent, usually paraffine wax or, according to the judgment and practice of the size maker, one or more of the remaining substances available for this purpose. If weighting is to be done, then the clay or other mineral substance is added, and finally the preservatives.

Now, the size is thoroughly boiled and stirred for a few minutes, when the addition of such colors as is required may be made, allowing the machine to run while the temperature goes down.

If gum tragacanth is used as a base, wholly or in part, it must be allowed to soak in cold water for at least two days before a good "solution" can be made from it—the term solution in this case is not strictly correct, for gums do not truly dissolve, but swell up, at the same time absorbing large quantities of water. This is well shown by tragacanth, sixty parts of which produce an excellent paste with one thousand parts of cold water. Of course, to make the tragacanth paste perfectly smooth, it must be heated and strained.

CLEANLINESS.

To make sizes or finishes properly requires that all tubs, tanks, vats, strainers, paddles and other utensils should be kept always clean, and the only time to clean them thoroughly is immediately after they have been used and before they have had any chance to dry out.

If it becomes necessary to keep sizes for several days, for instance, from Saturday to Monday, the storage tank should be kept covered to keep out the dust. If a shut down for a longer period is contemplated, the tanks, vats and other tubs should be thoroughly rinsed out with two or three pails of water containing a few ounces of carbolic acid. This will prevent the formation of dangerous mildew growths that may ultimately find their way to injure yarns or piece goods to which they may become attached.

The general sizes used for special purposes are few, ordinary cottons being sized with starches, often with flour, while flour is made much use of for cotton warps.

Cotton backed woolen or silk goods, and special pile fabrics require well made tragacanth sizes that must be free from metallic salts, and at the same time to be transparent, and which, when dry, do not feel hard or "crackly," but impart a leathery handle to the goods.

None of the substances mentioned, when used either alone or in combination with any of the others, has the least action upon the fabric.

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Belfast, Ireland, has long been credited with being the natural home of the linen industry, where the people seem to inherit the art of weaving and finishing the tissues, but France enjoys the reputation of producing the very choicest linens in the world. Nearly all of them are woven on hand looms and are neither beetled nor calendered. They are not so showy as those of Belfast, but possess the peculiar quality that the longer they are used the more lustrous they become.

In the preparation of flax for spinning the process of carding is not necessary, the fibres being brought into proper condition by scutching.

## FINISHING WOOL AND MIXED FABRICS.

XXVI.

*BY N. REISER.*

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Wool is bleached in the form of raw stock, yarn or piece goods. We will describe here the bleaching of piece goods only.

In early times the stoving process of bleaching in closed chambers with sulphur was the only method used for wool. Recently other means have been employed such as sulphurous acid solution, hyposulphite of soda, potassium permanganate, various chlorides, hydrogen peroxide and electricity.

Very good results have been obtained with hydrogen peroxide, but, unfortunately, the cost of the process is too high to admit of its general use.

The electric bleaching process has not yet proved successful, and in spite of all attempts to find a substitute for the sulphur stoving process, manufacturers are still compelled to use that method with all of its disadvantages.

### BLEACHING WOOLEN CLOTH WITH SULPHUR.

There are two methods of handling the pieces in this process; in one the goods are hung on racks in the stoving chamber and left undisturbed until the sulphur fumes have done their work; in the other the pieces are carried slowly through the chamber on rollers, so as to thoroughly expose the cloth to the fumes.

This process is used only for plain white woolen pieces or for fancy goods in which the ground work is white. In the latter case the colors must be fast to the sulphur.

By the stationary process the scoured pieces, while still wet, are hung on pins in the sulphur house and in loose folds so that all parts of the goods may be exposed to the full action of the sulphur. The pins should be heavily tinned to prevent rust spots.

The sulphur is placed in a cast iron kettle on the floor of the chamber, and ignited by placing pieces of red hot iron with it. The door is then shut and the goods left in this condition until sufficiently bleached, generally over night. The goods are next rinsed in clear water.

Care should be taken not to use for handling other goods the tools and implements used in this process, as the adhering sulphur will injure or destroy the colors. The bleached goods should be dried in the open air as this preserves the whiteness of the wool; if dried in a closed room at a high temperature, the bleached wool is liable to assume its original yellow color.

The stationary process has the following disadvantages:

1. The water has a tendency to settle in the lower part of the pieces, causing an irregular action of the bleach.
2. The effect of the sulphur is apt to be strongest near the kettle in which it is burning.
3. The patterns in fancy goods may be twisted out of shape by hanging on the pins, and remain in this shape.
4. Yellow or yellowish green spots are sometimes caused by drops of impure water falling from the ceiling on the goods.
5. The fumes are injurious to the health of the workmen.
6. Much sulphur is lost when the room is ventilated preparatory to changing the pieces.

To remedy these defects the continuous process is employed by which the pieces are slowly carried forward in the open width through the sulphur chamber.

Fig. 97 shows an arrangement for this purpose. Owing to the presence of the fumes sulphur houses are located at some distance from the other buildings.

In the illustration, four different compartments are shown. At the left is the fire room (C), in which the sulphur is burned in the iron basin (A). The iron door (K) is fitted with a damper to admit air to the burning sulphur.

The fumes pass through the holes in the opposite wall of this room, as indicated by the arrows, then into the spaces (D), whence it passes through the openings in the floor (E), into the bleaching room (B) above. On each side of this room are placed rollers over which the cloth is carried back and forth in the open width.

A window enables the attendant to look into the room during the bleaching process.

An adjustable ventilator (L) is placed in the room. The speed of the cloth can be regulated and the pieces are passed through the room as many times as are necessary.

The unbleached cloth in the room at the right passes over the friction roll (P) by which the tension is regulated; thence between two small rolls into the bleaching room where it is carried back and forth over the rollers and finally between small rollers back to the room from which it started and over the drums (h, h). The rollers are driven by power and the tension on the cloth should be sufficient merely to prevent wrinkles.

The goods are handled in a cold solution of permanganate of potash for one-half hour, one-half pound of the permanganate being used for each forty pounds of goods. The pieces are then taken out, folded on a table and left in this condition for some time. Towards night they are treated in a sulphuric acid solution, being left in this bath over night.

The wool comes from the first bath a pale red; from the second a clear white.

On the following morning the cloth is taken from the sulphuric acid bath and entered in a solution of pulverized chalk, to

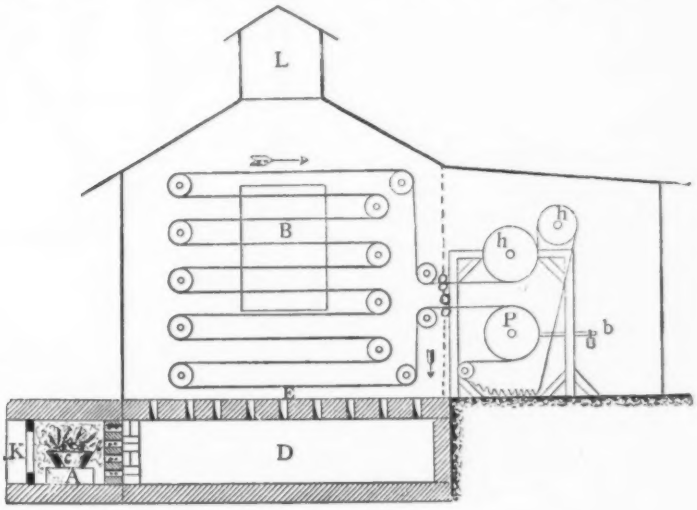


FIG. 97.

In many sulphur rooms the cloth instead of crossing the room, is passed up and down, an arrangement that facilitates the thorough and uniform distribution of the sulphur fumes through the goods.

By the continuous method just described the cloth is kept at the same degree of moisture during the bleaching process, a condition essential to uniform results. A blue tinge is sometimes given to bleached wool to relieve the intensity of the white.

### WHITENING WITH CHALK.

This process is employed for certain kinds of goods, principally those intended for the Orient, on which the sulphur bleach does not give the desired clearness.

which a small quantity of methyl-violet has been added. From six to nine pounds of chalk is used for each piece.

In this bath the goods are kept for about an hour at a temperature of 120 deg. F. when they are dried without washing, and the superfluous chalk removed by a whipping machine.

### COLORED SELVAGES.

The color is sometimes stripped from a narrow strip of the selvage to give the impression that the goods were dyed in the wool. The edge of a narrow strip of wood about one yard long is saturated with nitro-muriatic acid and applied firmly to the selvage when it is desired to strip the color.

After a few minutes the strip of wood is removed and the selvage ironed with a hot flatiron which makes the part of the cloth treated with the acid a bright yellow.

Another method of obtaining fancy selvages on piece dyed goods consists of protecting the selvage by sewing it tightly in a paper and linen wrapper. The paper is applied first, then the linen.

### BLUING GOODS.

This process is used for goods that are either partly or all white. Frequently wool is tinted in the rinsing bowl after scouring. Bluing pieces is a very difficult operation because the goods are easily made spotted and uneven. The following mixture is often used for this purpose:

1½ ounces aniline blue soluble in water,
¾ ounce sulphuric acid,
1 gallon water.

These ingredients are well mixed and left standing until thoroughly dissolved. It is a good plan to strain the solution through a cloth before using in order to remove any lumps that might cause spots on the goods. The solution is used in the quantity required for the desired shade. It is either mixed with water in the vat and the goods then immersed in the dilute solution, or it is diluted and applied in the washer when the goods are rinsed. Spots caused by the blue dye can be removed with alkaline solutions. A green tint can be obtained by using ultramarine green; the red shade by an addition of a red dye. Woolen goods treated in this way have a much brighter appearance. Care should be taken not to use too great a quantity of the dyestuff.

### FLOCKING WOOLEN GOODS.

If there is one subject on which I dislike to write it is the flocking of woolen goods, and all my readers will undoubtedly agree with me that it is not a praiseworthy work to increase the weight of a fabric with flocks. As many, however, are compelled to flock their cloths, the subject cannot be omitted from this work.

The object of flocking is to increase the bulk of the fabric and usually the flocks are applied only on the back of the goods. If the goods are wool dyed the color of the flocks should match that of the cloth. In addition to shear flocks, waste, brush flocks, etc., are used for this purpose. They are first run through a cutter, as otherwise the staple would be too long to enter the fabric. Fig. 98 shows a machine for cutting flocks. The

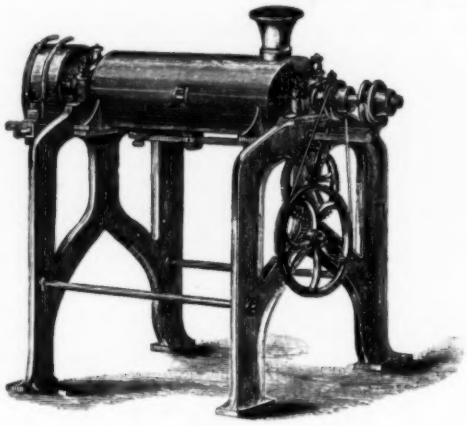

FIG. 98.

principal parts are the cutting blades, shown at Fig. 99, consisting of a bed plate in which are fastened blades against which the cylinder revolves. In addition to the rotary motion the cylinder is vibrated slightly endways to prevent the flocks from getting clogged in the machine, and also to cause the blades to wear uniformly. Fig. 98 shows that the cutting parts are enclosed in a metal case, at

FIG. 99.

one end of which is a spout into which the flocks are fed. The flocks then slowly work their way to the other end of the machine and drop through the opening at the bottom of the case. Suitable means are provided for adjusting the cylinder to the bed plate so that the flocks may be cut as fine as desired. The flocking process is as follows:

After the pieces are scoured and dried, both selvages are tacked closely together with the back side in. From four to six

pounds of flocks per piece are then poured into this pouch and distributed uniformly from one end of the piece to the other. The flocks can be spread over the pieces before they are tacked if desired. A thin soap solution standing at 1 deg. is then applied slowly and uniformly to the goods in the quantity required for fulling. If the cloth is too dry the flocks will roll up in small pills and, instead of becoming felted into the cloth, will roll out between the selvages. If the cloth is too wet the flocks, instead of entering the fabric, slip over it. It is of course understood that the goods must not be fulled at all before the flocks are applied. Many fullers run the pieces through warm and keep the fulling mill closed as much as possible during the fulling process.

A German fulling mill has been built which can be closed tightly when applying flocks. It is provided with steam pipes for heating. Some fullers use these machines for the beginning of the fulling process and finish in the regular rotary mill. Flocked goods should not be gigged on the back as this would remove a large part of the flocks.

(To be continued.)

## THE STRUCTURE OF COTTON DUCK.

*BY TURICUM.*

This article is written for those of the overseers of weaving who want to perfect their knowledge of duck manufacturing. When we start out to make any kind of plain cloth, twills or sateens, it is first necessary to know how many threads of warp and how many picks will lie side by side in one inch. This depends on the number of yarn to be used, and experience has taught us to multiply the number of yards in one hank (840 yards) by the number of yarn used, extract the square root and take 83 per cent. of the result.

To some it may be incomprehensible why the square root should come in, and others, having no experience of carding and spinning, may not even know what the name square root implies. For the instruction and benefit of those, these lines are written and we will have to start at the very bottom. Everybody knows that the heavier a yarn gets the larger is its diameter. But does this diameter increase in proportion? No, and the following will illustrate why not. For the inexperienced it is best to go over these instructions carefully and do as requested.

Take a ruler and draw a square having all sides one inch long. This is one square inch, indicated as 1 in$^2$. Draw another square having all sides 2 inches long. How many times is the first square inch contained in the latter? It will be found to go 4 times. Here already we see that by doubling both the height and width we increase the area by 4. Make a square now with 3 inch sides. This square will be found to hold 9 square inches. We therefore can formulate the rule, that by multiplying the height in inches by the breadth in inches we get the area in square inches of any rectangular square.

The square root now is nothing else than a retraction of these calculations.

It is obvious from the foregoing that if we have a yarn which is four times finer than another it also contains one fourth only of the amount of cotton and its diameter is therefore reduced to one half. We have seen in the example about squares that by doubling the sides the area was increased by four. The same rule holds good for circles and their areas. By doubling the diameter of a circle also the area is increased by four.

As already stated, to find how many threads will be side by side in one inch, the number of yards in one hank (840 yds.) is multiplied with the number of the yarn, the square root is extracted and 83% of this sum is the standard. How much would this give us for No. 1 yarn? The following calculation will show the reader how it is done: 840 (yards to hank) $\times$ 1 (number of yarn) $= 840$. $\sqrt{840} = 28.9$, and 83% of this number gives 23.987 threads, practically twenty-four. We therefore can, for our subsequent calculations take this for a standard as the number of threads of No. 1 yarn that lie side by side in one inch. Of course some slight deviations from this number might occur on account of especially hard or soft twisted yarn but anyone can himself make the tests and so arrange his standard number as to suit his requirements.

Having found this standard it is easy to find how many threads will be in one inch of No. 2 or any other number of yarn. Extract the square root of two and multiply by 24, the result will be the correct solution. $\sqrt{2} = 1.414 \times 24 = 33.936$, practically 34 threads will lie side by side of No. 2 yarn. For No. 3 yarn proceed the same way: $\sqrt{3} = 1.732 \times 24 = 41.568$. 42 threads No. 3 yarn lie side by side. No. 4 yarn: $\sqrt{4} = 2 \times 24 = 48$ threads per inch for No. 4 yarn and so on.

My experience has taught me, that for twisted yarns, the single number, which in weight would equal the twisted yarn, gives us the number from which to extract the square root. Thus a 3/12 (twelve 3-ply) yarn would equal No. 4 single. $\sqrt{4} = 2 \times 24 = 48$. There would then be the same number of threads in one inch of 3/12 ply as No. 4 single. This stands to reason. Both have the same amount of cotton in them and the cotton yarn is so soft that the fibres of one strand closely hug the others and no empty space is between. (It might be added here that in making duck the single yarns preferably are made slightly light so when they are twisted they will more resemble in weight the single yarn which they are intended to weigh. So a No. 12 would be spun about 12¼, and No. 8 about 8¼).

A theoretically correct cloth would be one with the same number of threads in the warp as picks in the filling. In the process of weaving the warp threads cross the filling threads at intervals and therefore their diameter will also have to be taken into account when figuring how many picks can be put into the cloth. In the reverse, the filling also crosses the warp and this tends to lesson the amount of warp threads in the cloth.

In the common plain weave for print cloths or duck where the repeat of the pattern is two threads the warp crosses the filling twice and so in return the filling crosses the warp twice. There will therefore be one pick, then one diameter of the warp, after the second pick another diameter of the warp and so there are in one repeat of the pattern actually four threads. This also holds good for the filling. Having found the number of threads that will lie side by side in one inch we consequently have to multiply this number by the threads in one repeat of the pattern, 2 in common plain and divide by 4, the number of diameters of both warp and filling in this repeat. Taking No. 40 yarn for instance, the square root is: $\sqrt{40} = 6.324$. Multiplied by 24 equals 151.776, practically 152 threads. Multiplied by 2 and divided by 4 gives us 76 threads per inch of warp and 76 picks per inch of filling.

On account of contraction in the width after the cloth is woven because of this crossing of the threads, the warp will have to be set wider in the reed, and a 33 dent reed with 2 ends in a dent might make this cloth. The contraction in the length warpways would be about 6 to 8%. In a common four harness twill where the repeat is 4 threads and the diameter of the warp or filling takes the place of the first or the latter respectively, we will have to multiply the number found by the number of threads in a repeat, 4 in this instance, and divide by the total of diameters, 6. The result would be $(152 \times 4) \div 6 = 101$ threads in the warp and 101 picks. Great variations from the technical figures, however, may take place, some to suit the requirements of a special line of goods, others to bring the weight up or down, but mostly less picks are inserted with an increase in the warp to cheapen the cost of weaving. If figuring on the cost of a piece of cloth made of two different numbers of yarn the percentage of warp and filling yarn must be known.

It has been found that to make a very hard duck it is well to take 60% of the complete weight of the woven stuff and use this for warp, for the filling will remain 40%. This difference is mostly accounted for in the great per cent of shrinkage which takes place during the process of weaving. Sometimes the warp shrinks up to 33% of the cloth's length. So if one yard of cloth be desired it is necessary to make the warp 48 inches long. Usually 27½% of the cloth length are enough to allow for mileage (contraction af the warp) and hereupon are based our following figures. Is the mileage more or less than that a half to one pick taken out or put in will amply make up the difference?

In making hard duck we can only rely on

the foregoing facts about ends per inch to a certain extent as the heavy duck looms have such a tremendous power that they easily hammer up picks into the cloth and in this way make it hard. There is a limit to this, however, and the writer has found from experience that ¾ of the number of threads which will lie side by side in one inch will go into the cloth if the warp has itself ⅞ of this number. In other words, if 24 threads (of No. 1 yarn) lie side by side, take ⅞, which is 21 threads, for warp and ¾, which is 18, picks for filling. The diameter of the warp, by having the filling beaten up against it is in this way reduced to about one half. We therefore have to keep in mind that 60% of the cloth weight is a good percentage for the warp and 40% for the filling.

If one knows what number of yarn has to be used, the number of yards of each, warp and filling, can easily be figured by the weight each has to contain. Subtract from the warp the 27½% of contraction. This will give how many single threads are to be contained in the warp. Divide this by the inches of the cloth width and the result will be the number of threads in one inch for the warp. Everybody knows that to find the number of yards of filling in any yard of cloth the picks per inch multiplied by the width in reed, multiplied by the number of inches in one yard gives us the number of inches of filling in this piece of cloth. Divided by 36 (inches in yard) gives us the yards of filling. Let us say a piece of cloth is 23 inches wide in reed and has 15 picks per inch, the calculation will stand as follows: $(23 \times 15 \times 36) \div 36 =$ yards of filling. Both 36's can be dropped out of this formula which leaves us the picks and width in reed to be multiplied together to get at the number of yards in any piece of cloth one yard long. Having figured the number of yards of filling by the weight of filling and the yarn used we therefore can simply divide these yards by the width in the reed and we get how many single threads have to go into one inch to make the required weight.

Some boss weavers may not be acquainted with the system of numbering yarn. Many have had no experience in this line, as the superintendent in the mill usually manages this part, but to understand these calculations fully it is imperative to have knowledge of this. After a little trying it will be found to be "dead easy."

The standard of length is 840 yards which is called one hank. One hank of No. 1 yarn weighs one pound; No. 2 yarn is twice as fine, therefore one hank only weighs ½ pound or 3,500 grains (there are 7,000 grains in one pound). No. 3 yarn is three times as fine as No. 1 and consequently weighs $7000 \div 3 =$ 2333⅓ grains; No. 4 is four times finer than No. 1, and No. 5 five times finer and so on . . . There are 16 ozs. in one pound, therefore one ounce contains 437.5 grains, $(16/7000 = 437\frac{1}{2})$. This number also ought to be remembered as the amount of grains in one ounce. To know how many yards of No. 1 yarn are in one ounce, divide 840 by 16 and the result is 52.5 yards. Also this number comes into the calculation.

Sail ducks usually are numbered very much like travelers in a spinning or twisting room, that is, by the weight. As a standard is taken a No. 3 duck which weighs 16 ozs. or one pound, 22 inches wide, one yard long. As the number becomes greater the cloth gets lighter at the rate of one ounce per number. No. 4 duck therefore will weigh 15 ozs., No. 5 weighs 14 ozs. and so on. . . . Going down the other side No. 2 weighs 17 ozs.; No. 1, 18 ozs.; 1/0, 19 ozs.; No. 2/0, 20 ozs., etc. All other widths are in proportion to 22 inches.

Having gone this far in the explanation of weights and the diameters of yarn we are enabled to start on a calculation to make the duck.

The problem is: Make a piece of No. 10 sail duck, weighing 9 ozs. to the yard, 22 inches wide, out of No. 12 yarn and the solution:

9 ozs., weight of cloth
5.4 ozs., weight of warp, being 60%
3.6 ozs., weight of filling, being 40%

(To be continued.)

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Manila hemp was first used in this country in the manufacture of hemp at Salem, Mass., about 1824.

## WOOL CARD ROOM POINTERS.

*BY SAM DRIVER.*

In the card room there is no room for dilatoriness or carelessness. Success comes as the reward of vigilance; not guessing that everything is right, but absolutely knowing it to be all right.

The temperature in the card room should be from 65 to 80 degrees.

Uneven roping makes uneven yarn; this is a common defect and is a source of much trouble, loss of time and temper. When weighing roping weigh each side and middle separately on top and bottom. This is the best and safest way to get both sides of the cards alike. Don't set the workers and strippers so close as to strike, but set them very close.

Running workers on the finisher backward stops waviness on the workers; it is also a very good thing to run them with variable speeds and set progressively from the back to the front, especially if the cylinder is slightly out of true.

The small fancy on leader-in not only keeps it clear, but also sharp. A small roll covered with No. 30 wire placed underneath and between the leader-in and tumbler is a good thing in reducing the lumps and evening the stock as it passes through.

By running the doffers on the first and second breakers moderately fast and side drawing slow on very short stock, a better blending of short and long fibres is obtained, which will add strength to the drawing, and more uniform distribution of long wool among the short waste fibres. Doffer rings are often ruined by careless stripping.

When stripping cards do not strip all through at one time except when changing to another color. Divide the stripping and do not put up the drawing before the card is well filled.

The boss carder may be a man of first class ability and have uneven roping from his cards now and then that he cannot account for, when it is often caused by the carelessness of his help. Carders might have less trouble if they watched the method of their operatives more closely. Sometimes the work is not done right through ignorance, rather than from an intention to do wrong.

It is not the closest setting of the worker that does the best carding. If set too close there is not much combing of fibres done after running a little while, instead there is a breaking of fibres and weak yarn will be the result. It comes to be more of a cutting than a combing process and the fibres are mangled and broken.

Setting with 28 gauge is fine enough for any stock and will do all the carding necessary, except some that is extremely hard to card; the cards run longer and keep in better order. Cylinders will run for months and even years without grinding, barring accidents.

The fancy has a good deal to do with this. When the points of fancy have too much of a needle point, it does not raise the stock from the cylinder as it should. It will raise the stock better if the points are ground off occasionally; this grinding will also take the streaks out, and the cylinder will not be so apt to wind.

Perfectly even yarn cannot be made, but they are even enough for all practical purposes. Carding shoddy, as it is possible to do, requires labor, vigilance, patience, and more skill than carding all wool. To card on paper is one thing; to run a card room and handle the help is another. It is not what you read that helps you to be a carder, but what you remember. When you see a good idea advanced on paper, on carding, or any advice given, write it down in your memorandum; sometime you may find it useful. If an old carder gives you advice, listen to it whether you believe it or not, then you can form an opinion whether it is good or bad.

When anything is wrong, first try to find the cause (if one way won't do, try another) before undertaking to fix it.

It is better to cover the doffer dicky with straight fancy wire. It is a good thing to have one dicky covered with No. 8 emery, with traverse attached. Set the workers to suit the quality of the stock. For anything that needs a round fuzzy thread, set the strippers off from the cylinder and set the workers off from the strippers.

The size of thickness of the steel setting

gauges is governed by card wire gauges from 24 to 34. Have the poppet head cleaned out every time the cards are stripped. The foundation of textile fabrics lies in the picker and card rooms.

Strength of yarn depends on evenness. Experimenting often leads to the best results, but is sometimes very expensive.

On some stock the burr guards on the first breaker may set close to the leader-in and run fast; set off on shoddy lots and run slow. A good knowledge of the quality of wools can be acquired only by years of practical experience. It is the mill that gets the most good yarn from a given quantity of stock, that pays.

A few pointers on a finisher card. Good feed rolls, leader-in, tumbler and fancy, with a good condenser, cylinder and doffer rings to match.

The object in carding is to save the staple and straighten out the fibres. When the cylinder clothing loses its point it loses its power to straighten out the fibres as they should be. Stripper belts and all others should be examined when stripping the cards. Too close setting of the workers to the cylinder has a tendency to draw the fibres too deep in the wire teeth and requires more fancy to lift it out. (Motto, save the staple.)

The cylinder can be kept sharp by the friction of the fancy. One of the best things in a card room is to run the cards without any stock in, after stripping, whenever convenient or when waiting for anything. A few hours running empty will keep the cylinder in the best of order.

Do not overcrowd the first breaker with stock, rather increase the speed of the doffer a little; it will not be so liable to come out nubby.

If any part of a card is making bad work and you know it, don't let it run; the bad work will surely come back on you, if not in the spinning, it may in the weave room or the finishing room. Spare no time, but stop the card at once and fix it. The trouble will then be off your mind, and when fixing anything it pays to take time and do it well.

Have good stripper belts and keep them tight and clean. Any old oil can is good enough for the card room, so they can slobber the oil all over the machinery and belts. Hundreds of gallons of oil are run to waste, soaking the floors and getting them ready to burn well in case of fire.

The card room should be supplied with the best of oil cans and the right kind of help to use them. Each stripper should have his own oil cans and should oil his own side of the cards.

Small hose pipes attached to the sprinkler pipes should be distributed around the card room in case of fire. This is far better than depending on fire pails altogether.

The Belgian pattern, diamond point with wire just pointing through the leather is good for ring wipe rolls on very low short stock. The teeth are short and readily part with the stock.

Automatic feeds on first breakers and intermediate feeds of the latest patterns are all good and are well adapted to the work they have to do. Some may need more attention than others to run them successfully; some are somewhat more complicated than others, but good results can be obtained from all of them if they are properly adjusted and carefully watched and attended.

The faculty of having discipline over the help and having the cards running steadily with careful attention to little matters, will aid wonderfully in getting off a large production without running the doffers at so high a speed. It is not the highest speed of doffer that produces the most yarn from a pound of wool; it is running them at a given speed to the speed of the cylinder and keeping them running steadily from morning till night (only when stripping).

Perhaps the readers ought to be informed that the writer draws only upon his own personal experience.

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The first carpet factory in the United States was erected in 1791 at Philadelphia. The first carpet made in this factory was a hand-made, finger-tufted fabric, for the United States Senate chamber.

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The fabric known as cheviot was originally woven in England from the coarse wool of the Cheviot sheep.

# Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

## The Cost of Cotton Cloth.

*Editor Textile World Record:*

What is the best book on estimating the cost of manufacturing cotton goods? I want to learn about the cost of converting the raw cotton into yarn and cloth. Stirling (362).

We do not know of any work giving the cost of cotton goods. There are a large number of books on the subject of cotton manufacturing, but none of them contain anything on cost. An article on Cost Keeping in Cotton Mills was published in the July, 1903, issue of our magazine. The writer was an expert accountant, having a familiarity with cotton manufacturing and we believe his system to be an excellent one. He gave a method of determining the cost of actual mill operations. An estimate of the cost of a given fabric is a different matter, and requires not only data as to the makeup of the fabric, but also carefully compiled statistics showing the cost of each process.

## Twist in Cotton Yarn.

*Editor Textile World Record:*

What is the formula for determining the amount of twist in spinning and twisting single cotton yarn? For example, if I am making 2/100's warp and filling, how many turns of twist must I put in the single and how many in the 2-ply? Starlight (360).

The twist is usually in proportion to the square root of the counts. For example, if 14 turns is found to be sufficient for No. 16 yarn, No. 64 yarn would have 28 turns to the inch, the twist being in the following proportion: $\sqrt{16} : \sqrt{64}$, or 4 : 8. Elaborate twist tables are to be found in many of the catalogues issued by the builders of cotton machinery. The twist varies with the use to which the yarn is to be put, the warp being twisted harder than the filling. Turicum writes as follows on this subject:

"When spinning No. 100 single, put in $\sqrt{100} = 10 \times 4.75$, or 47.5 turns per inch. The number 4.75 is called the twist multiple. For filling take 3.75 for a multiple, or 37.5 turns per inch for 100's. This rule holds good when making single yarns. When yarn is doubled, however, it is very seldom that a mill cares to run the same single yarns with different twist, for the simple reason that no matter how good the system is, the yarns are likely to get mixed, which would mean streaky goods. In such a case let the warp and filling be run with the same twist multiple, say 4.5, and put in different twist on the twister. For 2/100's warp I would use 4.5 for the multiple, which would give a firm warp twist; for filling use about 3.75 to get a "dead" twist. The different traveler's will make a difference in the kinking of the threads after twisting. If figuring the twist for ply yarn, extract the square root of the resulting count and then multiply by the multiple. 2/100's is equal to single No. 50. Extract the square root of 50 and multiply as already explained. No fixed rule can be laid down for determining twist. It depends on the different uses to which the yarn is to be put, and whether a hard or soft feel in the cloth is required.

## Chafing of Boucle Dress Goods.

Windsor Locks, Conn., Aug. 18, 1903.

*Editor Textile World Record:*

Referring to your question and answer on page 132 of the Textile World Record for August, 1903, referring to the chafing of boucle dress goods and note the difficulty that your correspondent is having in finishing them. As we have had some experience in this line, we would suggest that in finishing the goods should be folded "face in," so that the action in the finishing machine would not affect the loop in any way. We trust this will be of value to your correspondent.

The J. R. Montgomery Co.

## Ramie.

*Editor Textile World Record:*

I would like to purchase a quantity of dried ramie. Can you tell me where I can find it,

Fine Spun (363).

We shall be glad to refer to our correspondent anyone who can supply his wants.

## Bleaching Cotton Yarn.

*Editor Textile World Record:*

Referring to the inquiry from "Cherry Tree No. 338," page 158 of your last issue, as to bleaching cotton yarn, it might be well to call his attention to the following facts:

Cotton yarn should have good and even color, perfect strength which it retains indefinitely and the largest possible degree of elasticity. If your

correspondent wants these requisites he cannot use a process which influences the strength of the fibre; therefore, chemic (chloride of lime, bleaching powder) is out of question, for the reason that by-products of that process cannot practically be absolutely removed from the goods after bleaching, and being concentrated in the drying remain on and damage the fibre, whose strength and elasticity are thereby affected.

The installation for the chemical bleach is very costly and requires a large amount of space. The cost of the process is hard to determine accurately in view of the damage resulting from carelessness, rush of work or other causes, for which allowance has to be made.

If the qualities above mentioned are looked for, if the large first cost is to be avoided; if a definite stable cost is essential; if damaging the goods is to be done away with absolutely, the peroxide of sodium process can be recommended with confidence that it will fulfill all these requirements.

SNOWFLAKE.

## Yarn Numbering.

*Editor Textile World Record:*

Please state the relation between the worsted and cut system of yarn numbering. What would 2/20 cut yarn be equivalent to by the worsted system? Broome (358).

The Simplex yarn tables give an explanation of the basis of each system and also enable one to find the equivalent of any system in the units of the others. No. 1 worsted = 2/3 cotton; 1.8 2/3 linen lea or woolen cut; .35 run. No. 1 linen lea or woolen cut = .535 worsted; .357 cotton; .1875 run. From this it is clear that No. 2/20 cut is equal to single 10 cut or No. 5.35 worsted.

As all our systems of yarn numbering are based upon the fixed weight of one pound, their proportions are expressed by the length of the skeins used for them. Thus: Linen or woolen cut, 300 yards; worsted, 560 yards; cotton, 840 yards; woolen run, 1,600 yards.

## Equipment of a Cotton Yarn Mill.

*Editor Textile World Record:*

What machinery would be necessary to equip a cotton yarn mill to produce, in a week of 59 hours, 20,000 lbs. 2/24's, 5,000 lbs. 2/30's and 5,000 lbs 2/40's?

Batavia (349).

We have referred the above question to two practical cotton mill men and their replies are as follows:

1. The question as it stands is very difficult to answer except in an extremely general way because the class of yarn affects the equipment so much. A mill being built for the production of very common or poor grade of yarn could be equipped in one way and if for a higher class would call for larger equipment in the card room.

Answering the question in a general way I should say the following equipment would be required:

Bale breaker and mixing lattices; 2 combined openers; 3 breaker lappers; 3 finisher lappers; 40 cards; 34 deliveries, breaker drawing; 34 deliveries, inter drawing; 34 deliveries, finisher drawing; 3 90-spindle slubbers; 8 120-spindle intermediates; 14 180-spindle roving; 1,000 spooler spindles; 21,500 ring spindles; 9,800 twister spindles; 500 spooler spindles for winding twist bobbins on to spools.

Then in addition to these there would be the reels or warpers required if you were to take the yarn out in the hank or the chain.

I have not specified the size of the twister spindles or the ring spindles, as, if a man was building this plant it would have an important bearing on the equipment of his machinery whether he anticipated at times making coarser or finer work than the question called for. The length of the spindles in a frame I have also left out as that would be a matter largely of individual preference. Nearly all the American spinners use short spindle frames from 208 to 244, while the English spinners use very much longer frames. The length and size of the roving frames and slubbers also depends quite a bit on the locality where the mill is built. Where there is an ample supply of small help and it is difficult to get a full number of grown-up people, it does not pay, as a rule, to put in 45-inch cards or 12-inch slubbers, because this width of card or lift slubbers require a tall hand to operate them successfully. In such a case a 40-inch card and a 10-inch lift slubber would answer better.

Spindle.

2. The machinery for a cotton yarn mill making 20,000 2/24's, 5,000 2/30's and 5,000 2/40's should be:

Two automatic feeders with trunk system connecting breakers; 3 intermediate pickers; 3 finishers; 38 cards; 2 process of drawing 6 into 1; 8 frames 5 delivery each, metallic rolls; 4 slubbers, 84 spindles each, 12 by 6 by 10 1/4 space; 7 intermediate, 136 spindles each, 8 by 4 by 6 in space; 25 fly frames, 152 spindles each, 7 by 3 1/2 by 5 1/2 in space; 90 spinning frames, 224 spindles each; 1 3/4 ring for 24 to 30 yarn; 1 5/8 ring for 40 yarn; 30 twisters of 360 spindles each.

Machine Fitter.

Baton Rouge replies as follows:—The machinery needed for producing 30,000 lbs. of yarn as specified will be approximately as follows:—

2 Breaker pickers each producing 17,530 lbs. of 15 oz. lap.

2 Intermediate pickers each producing 17,000 lbs. of 13 1/2 oz. lap.

| | Production each per week in lbs. | Dia. of the front roll. | Approximate R. P. M. of front roll. | Approximate spindle speed. |
|---|---|---|---|---|
| | | Doffer | | |
| 35 Cards | 900 | 27 inches | 13½ R. P. M. | |
| 34 Finisher Drawframe Del. | 920 | 1⅜ " | 350 " | |
| 360 Slubber Spls. | 86 | 1¼ " | 160 " | 660 R. P. M. |
| 1,022 Intermediate Spls. | 30 | 1¼ " | 140 " | 910 " |
| 3,580 Roving Spls. | 8.5 | 1⅛ " | 133 " | 1,350 " |
| 20,000 Ring Spls. | 1.5 | 1 " | 130 " | 10,000 " |
| 8,350 Twister Spls. | 3.6 | 1½ " | 115 " | 6,500 " |

2 Finisher pickers, each producing 16,500 lbs. of 12 oz. lap.

Automatic feeders or openers may be added to the above; but, as they are usually connected to the breaker picker, we will assume them a part of that machine. In giving the remainder of the program, I am taking for granted that it is to be carded, and not combed yarn.

Again, the machinery after the twister, will depend upon the final purpose of the thread; therefore the twister, is as far as is necessary to produce a two ply, as indicated in your question.

The average counts produced in the mill will be approximately 27 2/3, and this I presume is made from double roving on the spinning frame.

The above particulars being understood, the list of machinery from picker room to twister will be approximately as follows:

| MACHINE. | Weight or hank fed. | Ends fed for each and delivered. | Approximate draft. | Weight or hank made. |
|---|---|---|---|---|
| Breaker Picker | ..... | — | 2 | 15 oz. per yard. |
| Intermediate Picker | 15 oz. lap. | 4 | 4⅛ | 13½ " " |
| Finisher Picker | 13½ " | 4 | 4½ | 12 " " |
| Card | 12 " | 1 | 86 | 60 grains " |
| First Drawing | 60 grs. per yd. | 6 | 6 | 60 " " |
| Second Drawing | 60 " " | 6 | 6 | 60 " " |
| Third Drawing | 60 " " | 6 | 6½ | 55 " " |
| Slubber | 55 " " | 1 | 5 | ⅝ hank. |
| Intermediate | ⅝ hank | 2 | 5 | 1.9 " |
| Roving Frame | 1.9 " | 2 | 6 | 5.7 " |
| Spinning Frame | 5.7 " | 2 | 9½ | 27⅔ " |
| Twister | 24 " | 2 | — | 2/24 " |
| Twister | 30 " | 2 | — | 2/30 " |
| Twister | 40 " | 2 | — | 2/40 " |

The above is based upon average results, consistent with good work, and while the proportion of spindle may vary according to the program of drafts, or hanks and weights, it may be advisable to give the program upon which the above are computed, beginning with a lap from breaker picker of about 15 oz. per yard, and working out to produce a 27 2/3 yarn.

The approximate amount of cotton required, with an allowance of about 17 per cent. for waste, will be 72 bales per week, of 500 lbs. each.

The weight or hank, and draft of each machine is practically represented in the following table.

## Oil Spots on Cotton Goods.

*Editor Textile World Record:*

What is the best method of removing oil spots on cotton goods? Grease Spot (356).

The subject of oil spots on cotton goods was very well handled by Daniel Moore Bates in a paper read at the New England Cotton Manufacturers' Association at its last meeting and published in the May issue of the Textile World Record. A dyer and finisher, who has had much experience with cotton goods, writes us that he knows of no way of removing mineral oil spots from cotton fabrics. They withstand the strongest bleach as well as boiling in lime and soda ash. The manager of one of the leading print works in the United States informs us that they do not attempt to remove the spots from the goods, but endeavor by every means possible to prevent them. When they do occur they are cut out of the goods.

# KNITTING DEPARTMENT.

**For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.**

## KNIT GOODS SITUATION.

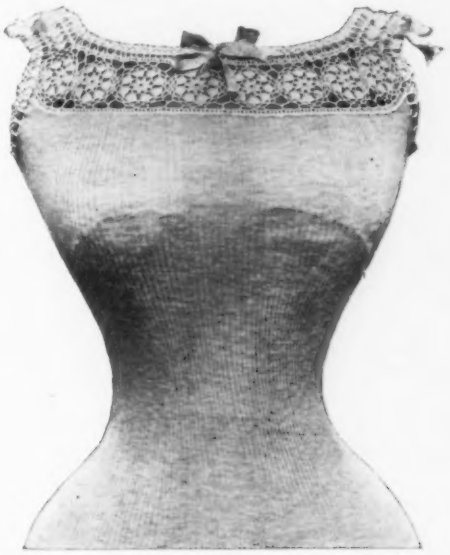
During the past month the underwear market has assumed a condition of mid-summer quietude. Considerable spring business has been placed, though probably considerably less than would have been placed had conditions been different in the cotton yarn market. Neither buyers nor sellers are making any special effort to complete the placing of orders, both factors appearing willing to await further developments. Several manufacturers, who have sold part of their product, have taken long chances on the yarn market without owning a pound, and have gone as far as they care to under these conditions. A number of buyers have thought that the changes were largely due to speculation, and have gone home intending to return in four to six weeks, after the appearance of a new crop of cotton, expecting at that time to get lower prices. Some of them have already placed small orders, which will enable them to get their samples and start their travelers.

There is now a weakness on some numbers of cotton yarn, but it is by no means as general as was looked for by this time, and the chances of lower quotations being made are less than earlier in the season—in fact, we learn of some slight advances being made within the last week on some numbers.

Stocks of summer underwear being carried over are light, and there is a full quota business to be done, and the manufacturer who shows an attractive line of popular priced goods will have plenty of business.

Some complaints have already been registered regarding the reduced qualities of spring goods; these complaints being that the traveler's samples being sent out are not up to the original samples from which the purchases were made. Buyers generally may be blamed for this as they do not want to pay advances even when they are legitimate, and it stands to reason that where goods have ordinarily paid a profit of 5 per cent. and the cost is now advanced from 20 to 30 per cent. it is not covered by the slight advance of 5 to 7 1/2 per cent. at which the business is placed. and the qualities must be cut some.

At the best, the coming season on spring goods promises to be an unprofitable one, and those who come out whole are to be congratulated. We fear that those buyers who are intending to return in four or six weeks, anticipating lower prices, have made an error.



Reputable manufacturers are well aware that if a break should come it will be necessary for them to readjust the prices or accept cancellations; on the other hand, should prices advance still further, as seems not unlikely, purchases must be made at the higher level.

Several leading concerns have done a very extensive business for a number of seasons past with a line of German lisle ribbed vests, and we present herewith illustrations of some new designs in hand-embroidered work made by A. Doehner, of Chemnitz. These are goods to retail at from $1.00 to $1.25. We

find, however, that our domestic manufacturers are making rapid progress in this class of work, and we have seen some very showy patterns of hand work at $3.50 per dozen, and shall endeavor to illustrate some of these in our next issue.

Nearly every manufacturer of men's summer goods is showing mesh garments of some description, and we are told that considerable business is being booked on this class of

goods. The Wright's Health Underwear Co. are making one at $7.50 which promises to be a seller. It is made of a white cotton, and an important feature is its elasticity.

The writer has just returned from a trip through the New York State underwear district, and finds that a large curtailment of production has been made during the past month, owing to the inability to procure yarn. Some mills with orders enough on their books to run them full time up to November and December have been obliged to run only three days a week, and they will be obliged to shut down altogether unless the conditions improve very materially. These manufacturers say they have contracts placed for all the yarn they need, but the spinners are unable or unwilling to deliver it, and considerable difficulty will be experienced this season before all the orders are filled.

Some jobbers are complaining regarding the delivery of men's fleeces. This, however, is principally on the lower and better end of the line and not on the $3.50 grade, as we find two of the largest manufacturers of this grade now in the market soliciting orders. Several buyers have been in the market recently looking after deliveries and report that it is harder to get goods for immediate delivery than ever before at this time of the year. Those who try to place any duplicate orders on ladies' 25 cent ribbed vests and pants are confronted with the greatest advances, as the prices have gone from $1.90 to $2.00, and the weights from 8 to 7 1/4 pounds, and instead of getting goods made from straight yarns they are offered goods made from waste yarns.

### HOSIERY.

A majority of buyers have placed their first orders for hosiery, although some few have not placed their full complement of orders, stating that they would either buy at home or return to the market later.

Advances of from 2 1/2 to 7 cents per dozen have been asked, and several manufacturers claim to have all the business they care to take, and we learn of a further advance of 2 1/2 cents within the past few days on some lines.

There has been considerable demand for ladies' and children's low priced goods in both ribbed and flat at from 60 to 70 cents, and the supply at these prices is comparatively small.

Lace goods of the better grades are in fair demand, but cheap laces are slow.

Embroidered goods have moved rapidly in both ladies' and men's half hose. Extracted goods are called for in certain localities, but the aggregate business is restricted.

Silk plated goods are cutting into the demand for the better laces, although embroidered laces are considered desirable property.

Western States are calling for solid colors in limited quantities, principally pinks, blues, and light reds.

### CHEMNITZ.

The market at the present time is in a rather unsettled state. Prices are so high

that most of the buyers are holding back their orders. Those who do buy take only what they must have.

If buyers expect to wait until prices are lower they will be unable to obtain any goods for next spring season, as there is no probability of cotton yarns being cheaper this year.

Staple Hosiery. In staple hosiery there are a number of large orders waiting to be placed, but manufacturers will not accept them at the limits. All machines are running full time with the exception of those making lace goods, the demand for which has fallen off.

In boot patterns lace hose with silk embroidery are selling fairly well. A great variety of patterns are shown in lace boots and allover styles, and buyers are taking extensive assortments, but in limited quantities.

There is a very good demand for women's split sole hosiery, and manufacturers have sufficient orders on hand to keep them busy for some months to come. Prices consequently are firm.

Fancy Hose. In fancy hose the new jacquard effects are selling fairly well, while striped goods are bought only in the lower grades.

Injected and extracted hosiery are selling better than last season. These are mostly bought on black or white grounds, colors being less in demand.

The principal trade in fancy hose is still on embroidered goods. Flower designs and small effects seem to be principally in demand.

**Automatic Hosiery Knitter.** The Hemphill Machine Co., Pawtucket, R. I., are placing on the market a full automatic hosiery knitter, which is described and illustrated in this issue.

**Lace Attachment for Knitting Machines.** Karl Lieberknecht, Oberlungwitz, Saxony. A device for producing lace effects in knit goods. It is claimed that a much wider variety of patterns can be obtained than has hitherto been possible.

As late as 1850 raw cotton was cleaned in England by beating with a stick and the fibres straightened by hand carding.

## MANAGEMENT OF A KNITTING MILL.

*BY FOREMAN.*

"You had better run out to the mill and take a look around and see what you think of the place, and at the same time get something to think about between now and tomorrow."

This was the salutation given to the new "Super" on arriving at a strange place and among strange people, by the representative of the firm who met him at the railroad station, and in accordance with the invitation given he found himself a few minutes later at the place where his duties were soon to begin. The door was opened, not without difficulty, and the first peep into the inside convinced him that in common parlance he was "up against it" and could rest assured that material for thought would not be wanting in the few hours that intervened between then and the following morning.

Investigation showed that the obstruction met with upon opening the door was composed of partly used cones of yarn, damaged tops and good ones and waste of every description connected with the manufacturing of hosiery. The stairway leading to the room above proved to be in the same condition, as were also both floors, cones of yarn of all numbers being thrown about promiscuously, as well as stockings in all stages of completion. The machinery was in a condition to correspond with its surroundings; the machines that were supposed to be in working order had the appearance of not being cleaned since the day of their installment, others not supposed to be in working condition had the appearance of junk, as parts had been taken from them, here and there, to replace those broken or ruined by incompetent operators and fixers.

Waste and imperfect goods were piled in all parts of the building, together with hundreds of cones of yarn of all numbers, some partly used, others having been kicked around until unfit for use, the whole making a combination which, to say the least, was discouraging, and made it an easy matter to imagine the discipline or rather lack of discipline among the help. After an examination

of the various rooms the new superintendent, having seen enough to convince him that time would not hang heavy on his hands for the first few months, returned to his hotel to think matters over and await the following day when he would come in closer contact with those who were responsible for the conditions described.

He arrived early at the mill the next morning and took a position where he could watch the help as they went in. The first day began with the help arriving anywhere from fifteen minutes early to a half-hour late. After waiting for half an hour after the whistle had blown he decided to look around to see how they started in. In the knitting room he found some of the machines in operation, some idle, and most of the help collected in groups of three or four earnestly engaged in conversation. Approaching the man who appeared to be the one who should be in charge of the room, he began to talk on general subjects, and found him a very pleasant young man of an easy going nature, placed there for what, it was hard to determine.

Returning to the office he was greeted by the same representative who had met him on the previous day, and who seemed surprised to see him on the premises at so early an hour. After a pleasant exchange of greetings the new super was taken in hand and introduced to the heads of the different departments, the first being the pleasant young man whom he had already interviewed and who seemed somewhat embarrassed at the formal introduction, but readily volunteered any assistance that might be needed. After learning that the mill was to close the following week for a week or ten days to permit of stock-taking, the new superintendent decided to let things drift along until a new start was made and in the meantime get acquainted and, out of curiosity, observe how the place was conducted, as there seemed to be a decided lack of system throughout.

On inspecting the work as it came from the knitting machine, it was impossible to find a machine which was producing goods that were fit for the market. When he asked who looked after the machinery in a certain section where the results seemed worse than the rest, he was informed that no one in particular, any one who happened to have a chance. Selecting one machine, the attention of the nearest fixer was called to it, and he was requested to put it in working order, and submit for inspection the first good stocking produced. After an hour or so the machine was again visited and found to be running as badly as before; the fixer was again called to the machine and the following conversation took place:

"Mr. B. have you got this machine in running order?"

"Yes, I guess so, I have not heard any more from it."

"Well, but I asked you to let me see the first good stocking produced and you failed to do so."

"Well I didn't think it was necessary as it ran all right while I was here."

"Then Mr. B. I can see that the sooner we understand one another the better for all parties concerned. Now in the first place, when I ask you to do a thing I shall expect and insist upon its being done and if you are not willing and capable of doing it, I must look for somebody who can. These machines are going to be put in working condition as soon as possible and anything about them that you do not understand I will gladly show you; this is the machine on which you must begin and put in perfect working order."

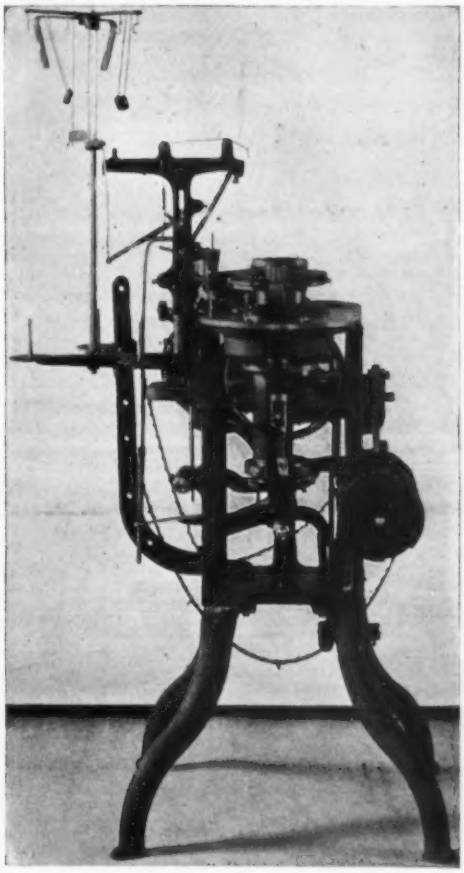
Another hour's work produced no better results, and the girl to whose set the machine belonged was earning nothing. Mr. B. was interviewed again and said that that was the best the machine would do, as the boss had told him that those kind of machines were no good and never had done any better work since he had been there. The boss (so-called) corroborated this statement and when asked how he managed to keep help with the machines in this condition, explained that they were "coming and going all the time and were an independent class and nobody could do anything with them as you will soon see if you stay around here long."

When asked who did the fixing he replied that he did with what help he got from his assistant but he didn't know much about it. He kept him because he was a good, smart fellow and would soon pick it up with a little showing, and just as soon as he had time he

was going to show him all about it.

"Well, now," the new superintendent said, "you take the time and show your man how to put that machine into running order and let everything else go until it is done."

The result was a great many consultations between the two, the spoiling of both stitch



THE HEMPHILL KNITTING MACHINE.

cams and a report to the superintendent that the machine was built wrong and could not be made to work and must be sent back to the maker. As that machine was a fair sample of the entire lot, it was evident that there was considerable to do and no one to do it.

(To be continued.)

The first muslin woven in the United States was at Pawtucket, R. I., by Samuel Slater.

## THE HEMPHILL KNITTING MACHINE.

The hosiery trade will be much interested in the full automatic seamless hosiery knitter, built by the Hemphill Machine Co., Pawtucket, R. I., and shown in the accompanying illustration. It is the result of prolonged experiments and practical tests to determine the best means of overcoming defects which have heretofore been looked upon as inherent to every knitting machine.

The builders offer it to the knitting trade with every confidence that a trial will substantiate the following claims: It has less parts than any previous machine and the parts are built to resist wear and reduce breakage to a minimum. Particular attention has been given to make the machine easy to operate. It is adapted for any style or gauge, and is provided with plating device and automatic changing attachment for heel and toe. One needle pick answers for all operations.

The construction allows easy access to needles and sinkers, and extra long bearings for cylinders assures a steadily running machine and increased uniformity of knitting.

By reason of these advantages the builders claim an increased production, more perfect work and reduced cost of operation and maintenance. The machine may be seen in operation at the shops of the Hemphill Machine Co., Pawtucket, R. I. It is sold under a full guarantee and the builders demonstrate their confidence in its merits by offering to install machines for a trial of thirty to sixty days. Further information may be obtained upon application to the builders.

## Wages of Knitters.

*Editor Textile World Record:*

Please inform me what wages are paid to knitters in the Eastern States. Old Kentucky (360).

An eastern knit goods manufacturer replies as follows:

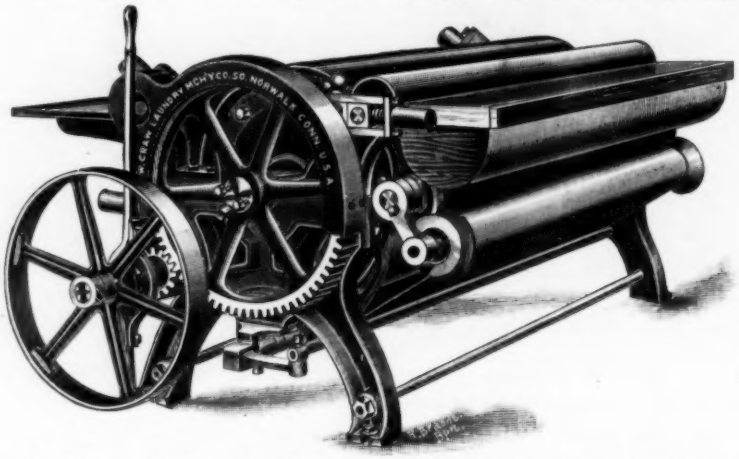
For girl operators on hosiery machines on piece work the wages would range from $5 to $7 per week; for young men running rib frames on men's or ladies' ribbed goods, from $1.12 1/2 to $1.50 per day; for young men operators on small rib frames for knitting the legs for hosiery, the wages run from $1.25 to $1.50 per day; for young men running

spring needle circular machines from $1.25 to $1.50 per day according to the number of cylinders they have the ability to keep running. For girl operators on this class of work on piece work the wages vary from $6.00 to $8.00 per week; for girl operators on rib machines, about $1.00 per day as a general rule.

I have given the different rates of wages for both young men and girl operators, because in some places in the east, Cohoes and Amsterdam, for example, nearly all the operators are young men, but in a good many places away from these two knitting centres, girl operators are preferred. I think this is due to the fact that the supply of female help in these knitting centres is needed for the sewing machine work, and there being few other industries besides the knitting mills in these districts, the male help is used for the knitting. In other places where there is other work to employ the male portion of the population, the female help is utilized almost exclusively in the knitting departments.

## IMPROVED IRONING MACHINE FOR KNIT GOODS.

The accompanying illustration shows an improved mangle for knit goods built by The J. W. Craw Laundry Machine Company, South Norwalk, Conn. It is claimed that this machine will iron underwear without breaking buttons or injuring the goods. It is specially suited for ribbed and flat underwear, leaves the surface smooth and enables a greater quantity to be packed in a case. It is inexpensive to operate, is easily adjusted and no skilled labor is required. All parts are carefully guarded to prevent accident to workmen. The machine is made in various sizes to suit the requirements of different mills. The following letters from manufacturers using the Craw mangle show the high appreciation in which the machine is held:




Alton, Ont., May 1, 1903.

The J. W. Craw Laundry Machinery Co., South Norwalk, Conn.

Gentlemen: I have just completed the installation of one of your No. 4 mangles. As evidence of my appreciation of the work done by said machine, I enclose check in payment of same.

Yours truly,
William Algie,
Manufacturer of knit goods and woolen yarns.

---

Toronto, Can., Feb. 23, 1903.

The J. W. Craw Laundry Machinery Co., South Norwalk, Conn.

Gentlemen: The ironing and pressing machine for knit underwear received from you is now set up and in working order, and we are very much pleased with it.

Yours truly,
Gordon, Mackay & Co., Ltd.

---

Hagerstown, Md.

The J. W. Craw Laundry Machinery Co., South Norwalk, Conn.

Gentlemen: Replying to yours of October 23, regarding the second mangle which you recently furnished and set up for us would say that like the first one it is doing its work very satisfactorily, and we are very much pleased with same.

Very truly yours,
J. C. Roulette & Co.

---

Adrian, Mich.

Gentlemen: Replying to your favor of the 11th inst., would state that the mangle purchased of you Dec. 31st, 1900, and which we are using, presses and irons the goods we manufacture very satisfactorily. More and greatly superior work can be done than

with a press, and at much less cost, and is therefore more economical. Adrian Knitting Co.

Hartford, Conn.

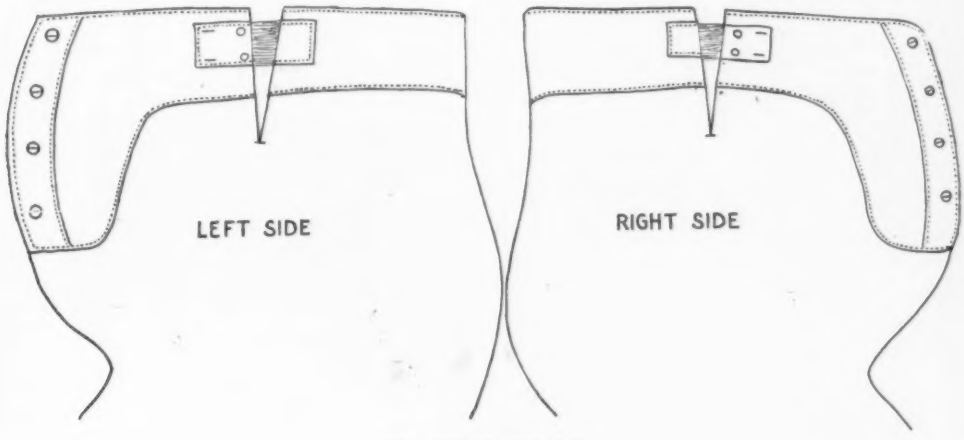
Gentlemen: I wish to say to you that the new improved mangle, with apron guide, etc., recently put in by your Company, has been in constant daily use ever since, and has given perfect satisfaction, in fact, it does more than you claimed for it and we are greatly pleased with its work.

B. S. Gilbert, Supt.

A large number of other mills are using the Craw mangle with most satisfactory results. The Superior Manufacturing Co., of Hoosac Falls, N. Y., have recently ordered a second machine. Further information can be obtained upon application to the builders.

## AN EXPANSION DRAWER.

The accompanying diagrams show the construction of an expansion drawer made by the Michigan Central Woolen Co., Centerville, Mich., R. E. Lidgerwood, selling agent, Medinah Temple, Chicago, Ill.




AN EXPANSION DRAWER.

At each side of the drawers is a slit or opening provided with an expansion strap, as shown in the illustration, allowing the garment to expand, making it much more comfortable for the wearer. Studs or buttons can be used as desired. The garment has given great satisfaction to every wearer of it, and we understand the manufacturers have made application for a patent in order to protect their rapidly increasing business in this specialty.

## SETTING UP AND CARE OF SPRING NEEDLE KNITTING MACHINES.

*BY F. W. HERINGTON.*

When the cylinder is filled with the leaded needles there will usually be a space left, which is not large enough to take in a whole lead.

If the space is more than half a lead, loosen up four or five of the needle plates on each side of the space and crowd the needles a little sideways so as to permit of another whole lead being put in, then proceed to tighten up the plates that were loosened, a little at a time, on each side where the space was; if the leads appear to be too tight, loosen up some more of the needle plates on each side of the previous ones that were loosened until in tightening up the needle plates the leaded needles block up to the cylinder. All of the needle plates in the cylinder may be loosened up in this operation and thus ensure the whole of the needles in the cylinder being of a uniform tightness.

If when the last plate of needles is put in the cylinder the space left is not large enough even to admit of half a lead, but only sufficient to have the last plate of needles loose, then proceed to losen up several of the plates each side of the space as before, and tighten up the plates again by starting at the extreme right and left of the plates thus loosened, being careful at the same time not to get the

needles out of plumb in doing so. When all the plates are thus tightened up, it will be found that the space has been evenly filled in.

Leaded needles should not be crowded into a cylinder too tight, nor should they be too loose. A good way to test the needle cylinder for tightness or looseness, is to loosen a plate and take one or two leads of needles and proceed to put them in again and "block" up the plate by a slight blow with the hammer end of the wrench; if they "block" up hard, then the needles are too tight, and if after blocking them up (before tightening the screw) the needles can be moved sideways with the fingers, then they are too loose and the plates must be loosened up all around, and another lead put in. After the needles are all in the cylinder, they must then be pliered. Take a pair of needle pliers and go all around the cylinder straightening up any of the needles that may not stand perpendicular, and those that do not form a true circle are pliered either in towards the centre of the circle, or outwards from the circle, so that when the cylinder is run, the needles themselves will revolve in a true circle with the circle of the cylinder.

It is very important that this pliering of the needles be well done. The sinker or feed burr and the other wheels being stationary and the needles revolving in and through them, the stitches would be different if the needles are not in a true circle with the cylinder.

To plier the needles so as to have them true to the circle is best done by standing so as to be looking down on the needles and towards the right, holding the left hand on the inside of the leaded needles. In this way it can the more readily be seen which way the needles require to be pliered, that is either in towards the circle or outwards.

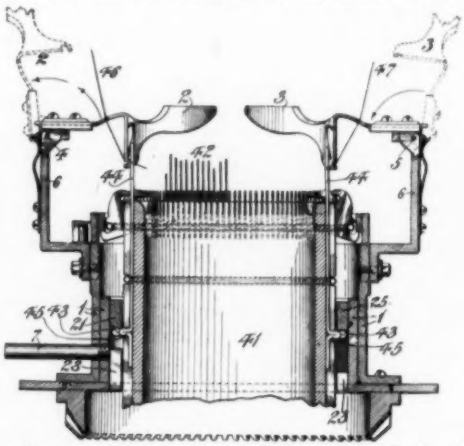
This pliering of the needles can also be done after the cloth is on and stitches are being made, by noting the size of the loops on different sections of the needles. Where the stitches appear larger than the most of the others, the needles should be pliered in towards the cylinder. After having done this and turned the machine around so as to form new stitches on the needles thus pliered, the difference in the stitches thus formed can be seen. Where the stitches appear to be smaller or tighter than the most of the others, the needles should be pliered outwards from the cylinder. By repeating the operation as above noted, all the needles can be pliered so that all the stitches are of a uniform length or size.

Even if the cylinder is old and has been run so that the bore is worn sufficiently to cause the cylinder itself to run out of true, pliering the needles in this way will cause them to form a true circle when revolving in and through the stationary wheels.

## Recent Knitting Patents.

Attachment for Knitting Machines. 733,964. John B. Hipwell, Philadelphia, Pa., assignor to the Windsor Machine Co., Reading, Pa.

This invention consists of means whereby the foot portion of a stocking is knit in two colors in



such a manner that one of the colors is in the upper part of the foot and the other color is in the lower part.

It also consists of means whereby certain of the loops in the upper half of the foot portion are interlocked with certain of the loops in the lower half of the foot portion during the process of knitting, and in such a manner that no seam exists where such interlocking of the loops occur, thereby producing a stocking in the foot portion of which two colors of yarn are used and so arranged to each other that one color is in the upper part of the foot portion and the other color in the lower part thereof.

Knitting Frame. 735,988. Theodor Lieberknecht, Hohenstein, Germany.

Figure 1 is a plan view of this knitting frame. Figure 2 shows the lateral displacement of the thread-guides due to expansion. Fig. 3 shows the lateral displacement of the upper needles due to expansion. Fig. 4 shows the application of the in-

vention to a cotton-knitter. In very large frames adapted to work a plurality of piece goods w side by side several parts and particularly the guide-rails b or the upper rails d, Fig. 4, are very long. The frame of the machine, the series of needles e being arranged in separate needle-beds, is formed of a long and heavy body, while the rails b d made of equal length are thin and comparatively light. When the temperature is raised—for instance by heating the workrooms is winter—the thin rails b d will be heated more quickly than the heavy

*Fig. 1.*

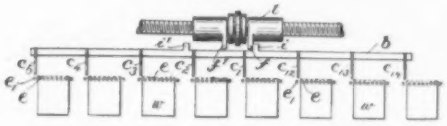


*Fig. 2.*

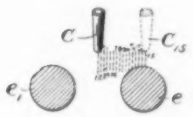
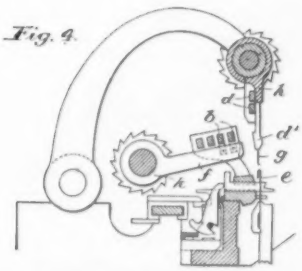


*Fig. 3.*

*Fig. 4.*



frame and therefore they are expanded to a greater extent than the latter, whereby in the construction heretofore used the parts do not exactly correspond to each other during the first period of the work. The extreme or border loops become irregular or fail to be formed. Thus the frame will be useless until all the parts thereof are uniformly heated. The upper needles present the same objectionable feature, since the points of the said needles g cease to reach the middle line of the lower needle-groove and finally move to and beyond the edge of the lower needles, whereby the machine is also rendered useless. This will be better understood by reference to Figs. 2 and 3 and the vertical dotted lines therein. Supposing the knitter to have a plurality of needle-beds and the guide-bars to operate against buffers acting against their extreme ends, it is understood that in its proper operation the thread-guide $C^1$ $C^2$, etc., must always be in the middle line between the needle at the edge of piece of goods being knit and the next needle outside of it—that is, the first idle needle.

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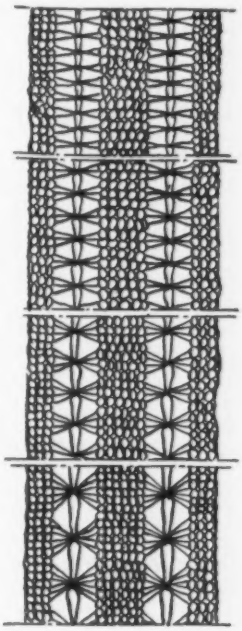
Knitting Machine. Automatic Rib. 735,910. George W. Ruth, assigner to Ruth Automatic Knitting Machine Co., formerly of Norristown, Pa., now of York, Pa.

This invention has for its object the provision of means whereby there may be formed in a ribbed fabric open-work effect in which more than two threads will be tied together in a single loop.



It also provides means whereby there may be formed in a rib fabric an open-work effect in which any desired number of threads may be tied together in a single loop.

It also has for its object the provision of means whereby in a rib-knitting machine having a constantly-operated pattern chain and an intermittently operated pattern-wheel and pattern-wheel-operating mechanism may be automatically engaged and disengaged from the pattern-wheel at the proper time.

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New York, Patchogue. The Patchogue Lace Mills will discontinue manufacturing carded lace curtains.

North Carolina, Augusta. J. D. Hodges and others are interested in locating a knitting plant here.

Rhode Island, Providence. The Watuppa Mills have been incorporated with a capital stock of $50,000 for the purpose of manufacturing textile goods. George W. Matthews, Boston, Mass., Enoch Pratt, of Middleboro, Mass., and Henry M. Boss., Jr., of Warren, R. I., are reported interested.

Virginia, Petersburg. The Virginia Consolidated Milling Company has recently been incorporated with Augustus Wright, president, and Charles Hall Davis, secretary. The Blue Ridge Cotton Mills have recently been transferred to the above concern, which now controls five mills at this place.

## KNITTING MILL NEWS.

**New Mills.**

*Georgia, Barnesville. The Empire Knitting Mill, recently organized with capital stock of $25,000 will manufacture underwear. They will start building operations this fall. H. H. Gray is interested.

Michigan, Mount Pleasant. Operations will be started about September 1st., by V. Stevenson, who has established a knitting mill here. The machinery has been purchased.

*New York, Nichols. The Nichols Knitting Mills contemplate having the new plant in operation about October 1st. The building is being prepared for the machinery. B. L. Winten is president of the concern; J. R. Edsall, vice-president and G. M. Cady, secretary and treasurer.

North Carolina, Monroe. W. C. Heath, J. J. Crow and John A. English are interested in a new company reported to be organized for purpose of erecting a hosiery mill at this place.

North Carolina, Winston-Salem. P. K. Green and others are contemplating the establishment of a new knitting plant to manufacture a special line of misses' seamless goods, with possibility of taking up full fashioned goods later, and are looking up the subject of equipment.

Pennsylvania, Hawley. The Hawley Knitting Works, Clemens Lenke, proprietor, is new plant located here. All kinds of knit goods are made.

Pennsylvania, Philadelphia. Barger & Fussner are just starting up a knitting plant at 4155 Frankford Avenue, which they will operate on fine infants' goods. They will finish goods at the mill, but not dye. The equipment consists of 40 machines which have been ordered from McMichael & Wildman and the Standard Machine Co. Mr. Barger is an experienced knitter and was for a long time a member of the firm running the Allegheny Knitting Mills from which he severed his connections a few weeks ago. Mr. Fussner has been connected with the E. G. Chester Knitting Co. as bookkeeper. The concern started operations August 1st.

Pennsylvania, Williamstown. George Mellon and D. H. Romberger comprise a new firm operating a plant here on high-grade hosiery. Have fourteen knitting machines and two loopers. Use steam power, and sell goods direct.

**Enlargements and Improvements.**

Alabama, Talladega. The Talladega Hosiery Mills are enlarging the plant. They now operate 35 knitters, but will instal 10 more in a few days. Some new dyeing machinery will also be put in for dyeing yarns.

*Georgia, Griffin. The Griffin Knitting Mills Co., after increasing the capital stock to $25,000 and providing for an issue of $25,000 of preferred stock, will greatly improve and enlarge the plant.

*Maine, Bucksport.. W. J. Creamer (of Penobscot) has started fitting up his branch mill at this place and as soon as the work of setting up the machines has been completed, will put same in operation.

*Maine, Penobscot. W. J. Creamer advises us that his business will remain at Penobscot, but that he expects starting a branch at Bucksport soon.

Massachusetts, Canton. Work has been started on foundations for new dye house for the Eureka Silk Company.

Massachusetts, Needham. An enlargement is under way to William H. Wye's knitting mill. A new 30 H. P. boiler is to be installed.

*Michigan, Muskegon. The Amazon Knitting Co., previously reported to discontinue manufacture of woolen goods, advise us that they will discontinue making gloves and mittens, devoting plant to spinning cotton yarns, 20 to 30, and making ladies' underwear and men's half hose. Plant is equipped with 10,000 spindles, 425 knitting machines and 240 sewing machines.

New York, Fort Plain. The Bailey Knitting Mills manufacturers overshirts and balbriggans, are making some additions to the machinery equipment.

New York, Rome. The Fort Stanwix Knitting Co.'s mill has been closed for two weeks, for purpose of installing new machinery.

*Pennsylvania, Scranton. The Paul Clemmons Silk Co. has increased the loom equipment from 75 to 100 recently.

Pennsylvania, Williamstown. J. W. Durbin & Sons have recently built a brick addition, 60 by 45 feet, to their mill.

*Tennessee, Nashville. Work will begin in about sixty days on an addition 30 by 100 feet to the dye house of the Nashville Hosiery Mills Company. This plant is equipped with 225 knitting machines and 40 sewing machines, making children's ribbed cotton hosiery. They purchase cotton hosiery yarns from 7s to 40s for use.

Vermont, Bennington. Geo. Rockwood & Co.'s knitting mill has been closed temporarily. A new water wheel is to be put in and some machinery installed in addition already completed.

**Silk.**

Wisconsin, Appleton. About 12 new knitting machines will be installed in the Crescent Knitting Co.'s mill. They will also increase the number of operatives.

**Mills Starting Up.**

Connecticut, Plainville. The Bristol Mfg. Co.'s mill, which has been closed for several weeks while repairs were being made to the machinery, has resumed operations.

New York. Amsterdam. Operations are expected to be resumed Sept. 7th in the Gardiner & Warring Co.'s mills, which have been closed several weeks.

New York, Cohoes. The mills of Cohoes started up Monday morning, Aug. 10th, after a ten days' vacation. Hope Knitting Co. started Aug. 17th. During the shut down the Walker & Williams Mfg. Co. placed a new 54-inch water wheel in their plant. The wheel was made by the Rodney Hunt Machine Co., Orange, Mass.

New York, Rondout. Operations have been resumed in the Cornell Knitting Co.'s mill, which has been closed recently. A movement is under way for increasing the capital stock.

North Carolina, Washington. Operations have begun in the Washington Knitting Mills. M. A. Smith is general manager of the plant.

**Mills Shutting Down.**

New York, Waterford. Novelty Knitting Underwear Co. has been shut down for a few weeks to give their help a short vacation. They expect to start up about August 24.

Pennsylvania Philadelphia. The Somerset Knitting Company, 2420 Waterloo street, is shut down and it is not known when it will again be started up.

**Facts and Gossip.**

*Georgia, Cuthbert. R. L. Moye, reported interested in the knitting mill project at this place, advises us that the organization has not been completed, but that work securing subscriptions, etc., is progressing nicely, and the project seems pretty well assured.

Massachusetts, Springfield. The Springfield Knitting Company has been forced to curtail production recently on account of the high price of cotton. About twenty-five per cent. of the help has been affected

Mississippi, Columbus. It is reported that a proposition has been made to this city by Geo. W. Kavanaugh of Cohoes, manufacturer of knit goods, who contemplates removing his plant south. The matter is under consideration by the Citizens' Progressive League.

Nebraska, Omaha. The Van Camp-Hazleton Hosiery Company has been incorporated with capital stock of $25,000. Ira L. Van Camp, H. Hazelton and H. F. Roberson are interested.

New York, Cohoes. The Root Mfg. Co. has started running the plant until 9 p. m.

New York, Cohoes. Night work has been suspended in the John H. Murphy Manufacturing Company's and the Parsons Manufacturing Company's Mills.

New York, Cohoes. The Reliance Sweater Co. is contemplating building in southern part of the city. They are getting out samples in the building with the Hope Knitting Co.

*New York, New York. The F. P. Knitting Company, reported incorporated here last April, has moved the principal office and business to Cohoes. This is the plant in which John F. Quinn of Cohoes is interested and upon which no details could be ascertained.

be subscribed in Erie and the balance to be taken by New York parties. The Erie Board of Trade has the matter in charge.

Ohio, Cleveland. The Standard Knitting Co. has removed the plant from Erie street, to new building on Viaduct street. Concern manufactures fancy knit goods.

Ohio, Cleveland. The United Knitting Co. has been incorporated with capital stock of $200,000, by J. H. Sampliner, C. A. Neff, Geo. B. Riley, H. L. Smith and H. A. Beckett. It is understood that this is a merger of knitting mills in Cleveland.

Pennsylvania, Reading. The Empire Knitting Mills Co. has recently been incorporated with capital stock of $15,000 and is a consolidation of the Stork Knitting Mills and the Sinking Spring Hosiery Mills.

*Pennsylvania, Williamstown. The Diamond Knitting Mills, burned last October, have been rebuilt. William Sheldon, formerly vice-president of the concern, is now superintendent of the Durbin & Sons Hosiery Mills.

*Texas, Wetherford. George M. Bowie, reported interested in the establishment of a knitting mill at this place, advises us that the town will offer some inducements to parties who will establish some such plant. They have a 5,000 spindle yarn mill there, which would supply the necessary yarn less than the market price.

## PERSONALS.

**Knit.**

A. Senior, boss dyer at the Rockford Mitten & Hosiery Co., Rockford, Ill., has resigned, owing to ill health.

Samuel Weeks, boss carder for A. H. & C. B. Alling, Derby, Conn., has resigned.

Joseph La Due has been engaged as carder at Robert McKinnon & Co.'s mill, Little Falls, N. Y.

Rhode Island, Woonsocket. Richard Reilly is now overseer of the knitting room at the Glenark Mill, succeeding William Maguire.

Fred H. Burrows has accepted a position as superintendent of the Utica Knitting Co.'s mills.

Mr. C. B. Bennett succeeds Charles M. Robinson as night superintendent at the Perry Knitting Co.'s mill, Perry, N. Y. Mr. Robinson has accepted a position as boss carder at the Lancaster Mills, Clinton, Mass.

Virginia, Petersburg. The Matoaca Manufacturing Co.'s plant is operated but four days a week on account of condition of the cotton market.

*West Virginia, Berkeley Springs. The Black Rock Knitting Co. has not yet made any decision concerning establishment of a branch mill here.

West Virginia, Berkeley Springs. It is reported that the Black Rock Knitting Co., of Hagerstown, Md., contemplates establishing a branch mill here.

# New Machinery and Processes.

**This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.**

**We invite machine builders and others to send us such information for this department.**

**Process for Making Woolens Unshrinkable.** C. Scott Althouse, Reading, Pa., is placing on the market a process, called "Nevershrink," which is said to render woolen goods unshrinkable. A description appears in another part of this issue.

**Noil Motion.** Alfred Motte & Co., Roubaix, France, have recently brought out an automatic device for removing the noil from the needles of the Lister wool combs. It can also be used on flax combing machines.

**Spooler.** J. J. Rieter & Cie, Winterthur, Switzerland. For spooling yarn from cops or skeins on short spools. The machine can be adjusted to suit spools of different lengths.

**Continuous Open Cloth Bleaching Machine.** Manuel Muntadas Rovira, Barcelona, Spain, has constructed a machine for continuously bleaching cloth in the open width, which it is claimed, effects an important economy in material, labor and steam, over the kier system.

**Nipper Knife for Combers.** Dobson & Barlow, Bolton, Eng., have recently brought out an improved nipper knife for the Heilman comber. The improvement consists in covering the knife with leather, the object being to allow of its closer setting to the needles of the cylinder. Owing to the liability of damage to the needles the old style of knife could not be set as closely as was desirable. It is claimed that with the leather-covered knife a thicker lap can be operated, increasing the production from 30 to 60 per cent. under the same conditions.

**Self Threading Shuttle.** Wilson Bros. Bobbin Co., Garston, Liverpool, England, have recently placed on the market a self-threading shuttle which has been tested with very satisfactory results. The only friction which takes place within the shuttle is over a steel pin. It is claimed that it is practically impossible to divert the thread by ballooning or any other movement caused by the movement of the shuttle in the shed.

**Cloth Cleaning and Shearing Machine.** Tomlinson-Haas, St. Mary's Gate, Manchester, England, are putting on the market an improved cleaning and shearing machine which is giving excellent results wherever used. It is adapted for such fabrics as shirtings, linings, calicoes, mercerized goods, etc. The cloth after entering the machine is first brushed by two spiral brushes which remove all loose foreign matter and raise the nap for shearing. The cloth next passes over a movable hollow bed on which the knives work. The special feature of this machine is the use of an air blast for aiding the shear and press. The air current enters over the cutting edge of the knife and carries away the flocks as fast as they are cut. Another improvement consists in forcing a current of air through the fabric which helps to raise the nap for shearing.

**Improved Self Acting Mule.** Dobson and Barlow, Bolton, England, have recently remodeled their well known mule and are embodying many improvements, mostly of a structural character. The nosing motion has been changed and, it is now said, gives a perfectly formed cop nose. The backing off cone has been made larger, giving increased command over the rim shaft.

**Dyeing Machine.** Oswald Gruhne, Goerlitz, 5 Promenade, Germany. An improved dyeing machine for raw stock, in which the liquor is circulated through the stock by a centrifugal pump set in the bottom of the tub. The machine, it is said, can be built at a low cost, is simple, in construction and has given good results on both loose stock and yarn.

## THE DUNN FLYER.

An unfilled and pressing want in the cotton industry is an improved flyer of American make and it is our privilege to call the attention of the trade to the Dunn flyer, now manufactured by the Textile Machinery Company, 50 State St., Boston, Mass. It offers important improvements and economies in the manufacture of cotton yarn, and embodies new principles in flyer construction which have proved their merit in actual practice. Our illustration shows the Dunn flyer

THE DUNN FLYER.

ready for operation. The first feature to attract the attention is the two short arms, one supporting the presser lever, the other serving to balance the first one. Being short and rigid these arms are not deflected in the slightest degree by the centrifugal force, even at the highest speed, as are many flyers of the usual long arm construction. This also admits of the building of about one-half inch larger bobbin. Another advantage which will be appreciated by every practical manufacturer is that this flyer retains its balance under all conditions, and being about two ounces lighter than the usual type a much more steadily running spindle is obtained.

Another great advantage of the new flyer is that the roving can be run under as little tension as desired because the slot is entirely on the side of the arm as shown in the illustration. This makes it impossible for even the finest roving to fly through the slot, a difficulty that is well known with the old style of flyer. The remedy for this trouble with the old flyer is to put in more twist so that the tension on the roving can be increased and cause the roving to remain inside of the tube. Twist in roving, however, should be as slack as possible to make good yarn, and thus it often happens that the yarn is injured by the attempt to keep the roving from flying from this slot in the old flyer. This difficulty being remedied entirely by the Dunn flyer, it is possible to handle the coarsest as well as the finest rovings without change of the flyer or slot on same. The construction permits a perfect adjustment of the centrifugal balance and reduces the friction of the presser on the roving to a minimum. As a consequence, the roving, it is claimed, is more uniform, stronger and runs with less breakage.

The operatives say the Dunn flyer is easier to handle and clean, and no trouble whatever is experienced by dirt and fly catching in the slot. It has given complete satisfaction wherever used and undoubtedly marks an important improvement in cotton manufacturing. The Dunn flyer can be applied to any frame, old or new, without entailing any change in the frame itself.

The company has received very gratifying reports from representative mills using the flyer as to its efficiency and most satisfactory working.

Further information can be obtained on application to the builders, the Textile Machinery Co., 50 State St., Boston, Mass.

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The ring spinning frame is entirely American in origin and development. The first patent issued for this device was to John Thorpe of Providence, R. I., in 1828.

## DEWING AND SPRAYING MACHINE.

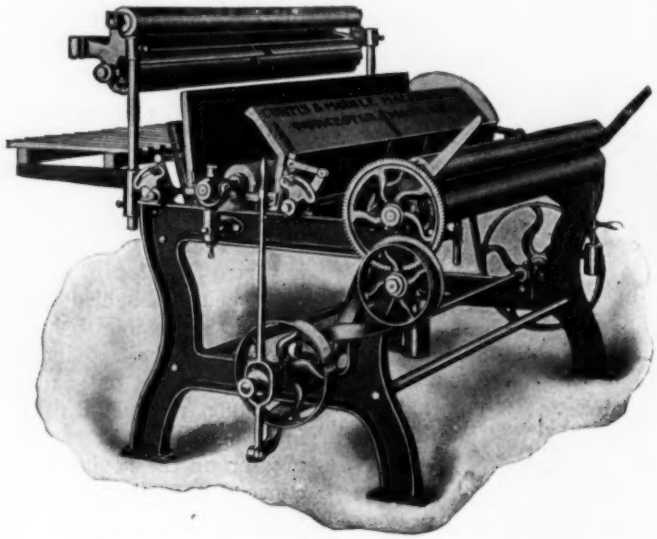
This illustrates an improved machine built by the Curtis and Marble Machine Co., Worcester, Mass., for dampening worsted, woolen, or cotton fabrics in the piece, either before or after pressing.

The cloth is laid on a platform at a convenient height from the floor, passes around the necessary guide rolls and stretch roll, over the spraying device, and then to the draft roll, where it is wound up in smooth, even rolls. The reservoir is of metal, so coated as to be rustless, and is filled with cold water. The spraying cylinder is made with a series of metal discs which revolve at a high rate of speed and cut the water into fine particles. These are dashed against a deflector board and strike the goods in the form of a fine, even mist or spray. The fineness and the volume of the spray are easily regulated by the position of the shield and the deflector boards at each side of the spraying cylinder. These are quickly adjusted so that the amount of water thrown on the goods is regulated according to requirements and the class of goods which you are running.

Drip boards at each side conduct the surplus water which is thrown off from the cylinder back into the reservoir. The construction of the spraying cylinder is free from the objections inherent in a cylinder covered with a wire brush, and requires no wire comb which demands careful adjustment and wears out in a short time.

The stretch roll is commonly used to remove wrinkles in the cloth, and is made with brass trucks and slides inside, and hard wood slats on the outside.

After being dampened, the goods are generally rolled up at once, so that the moisture is evenly absorbed. Weights are provided for giving sufficient pressure to make a firm roll. If it is desired to lay the goods off in loose folds, a folding attachment may be put on for the purpose.



THE CURTIS & MARBLE DEWING AND SPRAYING MACHINE.

This machine requires no outside attachments, viz.: no water pressure, no pressure gauge, no pumps, no blower, no steam, no compressed air, no filters, no nozzles. All that is necessary is the inlet pipe to bring the water to the machine, and the waste pipe to take away the overflow. The amount of water in the reservoir is easily regulated by means of an adjustable overflow pipe. The machine is simple and durable in construction, and may be used anywhere in the finishing room without danger of wetting the floor.

With this spraying machine the goods may be dampened evenly the entire length of the

piece, and from selvage to selvage, with a fine, even spray, free from streaks, or individual drops which would cause a clouded or spotted appearance. When treated in this way, many kinds of goods have a better finish and feel, and at the same time the water will restore or impart weight to the goods.

The machines are built in any desired width, usually for 6/4 or 7/4 goods. Further information can be obtained on application to the Curtis & Marble Machine Co., Worcester, Mass.

## WOOLENS MADE UNSHRINKABLE.

The invention of a process, by C. Scott Althouse, of Reading, Pa., for treating wool to make it unshrinkable, marks an important development in the woolen industry, and, it is believed will bring about a great change in the flannel and knit goods business.

The necessity of a process that will absolutely hold wool to its original length no matter how scoured or fulled has long been felt in the woolen industry, and the seemingly impossibility of such a process has been detrimental to the manufacture of all wool goods, that are to be washed. Very true many theories and processes have been advanced, but it is safe to say that not one of them will enable the original length of the wool to be held when subjected to hard washing or fulling as many demonstrations and failures have proven. Probably one of the most popular methods to try to overcome this defect is by mixing cotton, which is very unsatisfactory, overcoming only in a part the defect of shrinking, for as long as any wool is in the goods they are bound to shrink in proportion.

The Althouse process, which is called "Nevershrink" will cause woolen goods to retain their original length no matter how washed or fulled. Goods treated by this process have been fulled for hours without showing the slightest trace of shrinking, retaining the original length under the most severe tests. Shrinking and felting are the only two properties of the wool that are affected by this process. The fibre retains its original handle, elasticity, color, strength and luster. This is probably the most interesting fact of the process. That the process is absolutely permanent has been proven by the repeated washing and scouring. Some woolen goods treated with it have been worn for several years without showing a trace of shrinking.

It is said that the cost of treating wool with the process, to a manufacturer equipped with the necessary machinery, is very small, and would hardly compel him to raise the price of his goods. It is believed, however, that he could very easily secure a higher price, considering the advantages over non-treated material. A garment guaranteed not to shrink would doubtless prove very popular.

The field for the application of an unshrinkable process in the woolen industry is practically unlimited. Not only underwear, hosiery and flannel, but the many novelties and specialties in knit goods, novelty dress goods, blankets, especially those used in hotel, steamer, and car service, and a multiplicity of woolen goods that are, or would be washed if made unshrinkable, could advantageously be subjected to the process.

Chas. H. Heyer, Bustleton, Pa., who is the general sales agent will cheerfully furnish samples to those interested and demonstrate practically the impossibility of shrinking wool treated with this "Nevershrink" process.

### Imports of Wool and Woolens.

It will be necessary to go back to Wilson tariff times to find a year in which the imports of wool or woolen goods exceeded those of the twelve months ending with June, 1903. During the last named period 177,145,368 lbs. of wool came in valued at $22,155,096. This is an increase of 6 per cent. in weight and of 12 1/2 per cent. in value as compared with 1902, when the imports of wool amounted to 166,576,966 lbs., valued at $17,711,788, and made a new record for Dingley bill times, which has now been exceeded in the year just ended. The imports of woolen goods for the past year amounted to $19,545,721, an increase of 12 per cent. over 1902.

There are over 500 umbrella factories in the United States and more than half of the umbrellas used in this country come from Philadelphia.

# Dyeing, Bleaching, Printing, Etc.

## DIAZOTIZED BLACKS.

This class of blacks occupies a position between the ordinary direct blacks and the "salt" and suphur blacks that will remain permanent, or at least nearly so, for a long time.

In their properties they differ materially from the blacks above mentioned, although they possess quite a few of their good qualities.

The brilliancy of a diazotized black is remarkable and its intensity, when properly dyed, is difficult to approach. The most important point to observe in dyeing a diazotized black is to be sure that the full amount of color is on the yarn; that the diazotizing with the nitrite of soda and acid is complete; and that the developing is proceeded with as soon after diazotizing as possible.

It is absolutely necessary that the nitrite solution be used cold,—as cold as possible at all times—this will ensure deeper blacks. If water of medium temperatures be used, the resulting shades will look somewhat thin and hungry. Most diazotizable blacks are developed with one or two so called "developers" or combinations of them, viz., betanaphthol and toluylene-diamine. The former tends to the production of blue tones, and the latter to the black tones, consequently, a combination of both, in various proportions will yield corresponding intermediate shades.

The practice of combining developers is much to be preferred to the combinations of dyes for this process, because the dyer has his shades under much better control—he can add as his shade comes up, a little more of one or the other developer, and produce the desired result, whereas, if the shade wanted is controlled in the dyebath, the correction of errors or omissions, is difficult.

Regarding the comparison of this class of blacks with the sulphur blacks, we think the latter owing to further developments in their manufacture, will be the only blacks used for general textile work, at least recent opinions of practical manufacturers incline us to this view.

## UNEVEN DYEING OF COTTON WARPS.

Many dyers frequently complain regarding the peculiar streakiness of dyed warps, and attribute this defect to various causes, the most important being the unfortunate dyestuff, which, however, upon reflection will be found to be less likely to go on unevenly than many other causes that could be cited.

The simplest form of cotton warp dyeing is with the direct colors, and from a neutral bath containing either common salt or Glauber's salt, and to dye at the boil. In this process of dyeing the color is usually added in not less than two portions in order to assure the same depth of color throughout the warp's length. Now, under ordinary circumstances, it would appear that streaks or other unevenness could not occur, but a little thought will lead us to the conclusion that it would be necessary to prepare the cotton in a suitable manner for dyeing, and this preparation may consist to good advantage in a wetting out.

### WETTING OUT.

Wetting-out of cotton has been written about for several years past, and has been the cause of much discussion, some dyers claiming that the process is not essential to good results, while others regard it as an absolute necessity. However this may be, the writer regards a thorough wetting-out with a soluble oil as being absolutely essential to uniformly good results, and at all times superior to the older process of boiling out with soda.

It is a certainty, fully recognized by dyers, that level shades are only to be secured by dyeing well prepared and cleaned yarns, consequently, even after the soluble oil treatment a thorough washing with water is of the utmost importance.

Soluble oil is sold on the market under a

variety of names, and consists of nearly the same ingredients, being castor oil, in part or wholly, replaced by other oils of vegetable origin, treated with sulphuric acid until a sample is found to dissolve in water; the excess of acid is removed, and the resulting oil neutralized with soda or ammonia.

For successful results, we cannot use less than 3 per cent. of oil to each 100 pounds of cotton yarn, any less quantity is likely to leave traces of waxy matters undissolved. The temperature best suited for the work is 160 deg. F., a higher temperature is useless.

Wetted-out warps should be dyed as soon after the preliminary treatment as possible and not allowed to dry.

DISSOLVING DYESTUFFS.

It goes without saying that all dyestuffs should be dissolved in a separate pail or half barrel before being added to the dyebath, and even then they should be strained through a fine hair cloth. Of course, this entails a certain amount of extra work in the dyehouse, but it is the opinion of experienced men that it is a precautionary measure that amply repays for the extra time and trouble.

When large quantities of dyestuff are to be used, it will be found an excellent practice to pour boiling water over the weighed color in a pail or tub, and afterwards stirring with the gradual addition of more hot water.

Direct colors, particularly such as all mixtures, should always be dissolved and strained, and for the basic dyes straining should always be insisted upon.

In going through various dyehouses in different parts of the manufacturing districts, one cannot but be impressed with the personal tastes of the head dyers in handling such a simple subject as the weighing out and solution of dyes. Some dyers are so particular that they will not trust any one to do this work but themselves, preferring to weigh and dissolve the color in the drug room. Others give the weighed color to the kettle hand, and by him are dissolved and added to the bath, while there are others who simply designate the color and amount wanted, and let the helper attend to the rest, which may be simply pouring it into the vat as it is being filled with water.

As a matter of fact, the one way to do this work is to dissolve the color separately, strain it, and add the strained solution to the dyebath as wanted.

DYEING.

When warps are dyed with the direct colors it is very necessary that the dyeing be not commenced at too high a temperature, but rather to have the temperature gradually increase until the boil, and to finish at that temperature. If the warps are entered at a high temperature, say 185 deg. F., or over, the first portion of warp run through will be much heavier in shade than the other end and will cause a difficulty that is almost impossible to overcome.

If mercerized warps are to be dyed the first or initial temperature should not be much above 130 deg. F., for the well known affinity of this kind of cotton is so strong that the color "jumps on" so quickly that bad results will surely follow. The only safe practice is to add the dissolved dyestuff in several portions, and give the requisite number of ends to obtain proper depth of shade.

Bleached mercerized warps require that the dye be added in small portions at a time, and, for very delicate shades, in a very much diluted form.

Mordanted warps, such as for Madras goods, require careful handling, specially in the sumac bath. The amount of sumac to use should be regulated by its strength of tannic acid, and to allow not more than 10 per cent. over that actually required for the shade to be dyed.

It is generally conceded that the best results are to be secured by setting the wetted-out warps over night in a hot sumac liquor, and in the morning, squeeze or hydro extract, and give a run through the antimony salt solution, and afterwards a thorough wash in water. This washing is for a two-fold purpose, first to remove excess of antimony which would only cause a loss of some of the dyestuff, and second, to safeguard any tendency to bleed on the part of the final dyeing.

There is no question but the cleanest operations and treatments are sure to guarantee clean, non-bleeding dyeing.

Streaks are of frequent occurrence on many

warps and have been traced to machine dirt, which had not been properly removed before dyeing.

A word regarding dyestuffs; as a general rule, but few dyers of the present day seem to care to make their own combinations of colors, this being left by them to the colorists of the dyestuff houses from whom they make their purchases, who, however skilled in their branch of business, are as a generality ignorant of the usual mill processes as carried out on a large scale. The consequence is that many dyes are compounded of two and frequently many more single colors, with the result that level dyeing results are hardly possible on account of the different rates at which the several components of the dye mixture are taken up from the dyebath. The best practice, of course, is for the dyer to build up his shade, and if his skill is sufficient as a dyer and colorist, he should succeed with not more than two pure types of dyes, with a probable third for shading. Incompatible dyers frequently manifest themselves in mixtures causing uneven results, while the same dyes added to the dyebath in building up a shade would never show.

## DRESSINGS FOR COTTONS.

The following examples are given of dressings adapted to various classes of textiles, and will evidently meet the requirements of an inquirer for information on this subject. The several recipes given are from actual practice as carried out in different mills, but will serve as a basis upon which to construct a formula adapted to any particular fabric.

It is well to remember that to imitate a given finish is very difficult, without definite knowledge as to how it was prepared or applied.

### NO 1.—WARP DRESSING.

Boil together:

8 gals. Water.
100 lbs. Pipe Clay.
20 lbs. Palm Oil.

Stir, and when cold but during the cooling, add

22½ lbs. Chloride of Zinc Solution (Sp. Gr. 1.32).

22½ lbs. Chloride of Magnesia Sol. (Sp. Gr. 1.32).

In the meantime prepare a paste by stirring together:

80 lbs. Potato Starch.
16 gals. Water.

and add to the main solution followed by

30 lbs. Grape Sugar.

Bring again to the boil and boil for twenty minutes with constant stirring, when it is ready for use.

### NO 2.—DRESSING FOR STIFFENED LINENS.

Soak forty pounds of glue over night in twelve gallons of water, and in the morning boil until all dissolved, when twenty-two lbs. dextrine, dissolved in eight gallons water are added, followed by four and one-half lbs. of soluble (sulphated) oil. If this oil is not added the dried size will harden to such an extent on the fibres as to cause them to cut.

### BLACK SIZE FOR WARPS AND FABRICS.

This kind of dressing is used to some extent for certain purposes and meets with favor. Other coloring matter may be substituted for logwood for different effects.

Take:

26½ gals. Water.
20 lbs. Dextrine.

Boil together, and add:

2¼ lbs. Tallow.
1 lb. Wax (white bees).

When the fatty matters collect on the surface, add

12 gals. Water,

together with a cream made by mixing

20 lbs. Potato Starch.
3 gals. Water.

Boil for one-half hour and add

½ gal. Logwood Extract.
½ lb. Bluestone.
½ lb Bichromate of Potash.

Continue heating until all the chemicals have dissolved, strain and cool, when it is ready for use.

## THE PREPARATION OF WOOLEN PIECE-GOODS FOR PRINTING.

For the production of the most brilliant effects on woolen piece goods it is necessary that they be prepared in such a manner that the colors used will have the best possible ground to take hold, and which will in no way alter or modify the shades that are intended, either when the colors are used alone or in combination. In the first place, the fabrics as received from the loom must be thoroughly scoured to free them from the usual grease and dirt that is always present. This scouring should always be done with good soaps and clean water, and then the goods rinsed thoroughly. Although this is apparently the least important process, much of the ultimate success of the printing operations depends upon it, especially as relates to level shades.

From the initial scouring the goods should be bleached, several processes being available, but the best practice lies in the direction of the peroxides,—bleaching agents that leave the goods absolutely free from substances that might act injuriously at other stages of the process. If peroxide of hydrogen is used, the goods should be passed full width through the bleaching bath, which should be made up in the proportion of peroxide of hydrogen (12 volume strength), diluted with from 2 to 10 parts of water, according to the whiteness of the fabric desired.

In using commercial peroxide of hydrogen it is necessary to neutralize with ammonia, soda or silicate of soda the small quantity of free acid it always contains. If this is not done, and the bath made slightly alkaline, and tested with litmus paper, the progress of the bleaching will be uncertain.

Peroxide is always sold as of "12 volume" strength, this means that one volume of peroxide is capable of yielding 12 volumes of oxygen gas, and the "bleaching strength" is thus recorded by the chemist. As a matter of fact the actual percentage strength for 12 volumes peroxide is only 3.64 per cent. of real peroxide of hydrogen ($H_2O_2$). The following table will show at a glance how the "volume strength" and "per cent. strength." compare.

12 volumes $H_2O_2$ = 3.64 %
10 volumes $H_2O_2$ = 3.03 %
8 volumes $H_2O_2$ = 2.42 %
6 volumes $H_2O_2$ = 1.82 %
4 volumes $H_2O_2$ = 1.21 %
2 volumes $H_2O_2$ = .60 %

For preparing the bleaching baths of any particular strength from commercial 12 volume peroxide, the following table will be of use:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 part | 12 vol. | $H_2O$ | and | 9 | parts | water | = | 10 | parts | 1.2 vol. | $H_2O_2$ |
| 2 parts | " | " | and | 8 | " | " | = | 10 | " | 2.4 | " " |
| 3 " | " | " | and | 7 | " | " | = | 10 | " | 3.6 | " " |
| 4 " | " | " | and | 6 | " | " | = | 10 | " | 4.8 | " " |
| 5 " | " | " | and | 5 | " | " | = | 10 | " | 6.0 | " " |
| 6 " | " | " | and | 4 | " | " | = | 10 | " | 7.2 | " " |
| 7 " | " | " | and | 3 | " | " | = | 10 | " | 8.4 | " " |
| 8 " | " | " | and | 2 | " | " | = | 10 | " | 9.6 | " " |
| 9 " | " | " | and | 1 | " | " | = | 10 | " | 10.8 | " " |

Owing to the closeness of the specific gravity of peroxide to water, the use of Twaddle or other similar glasses cannot be used. The only correct method of testing is by means of volumetric analysis.

In actual bleaching, loosely woven cloth or other thin fabrics can be bleached with the weaker solutions, while the stronger solutions are required for heavier fabrics. After a passage through the bleach bath, roll the goods, and let them lie covered for 12 to 24 hours, then wash, and afterwards run through a bath containing about 20 per cent. of 70° Tw. bisulphite of sodium, wash well again, acidulate and wash.

### PREPARATION OF THE GOODS.

This increases very materially the capacity of the wool fibres to take up color, and it has been found that the most satisfactory agent to use is chlorine—although one of the legacies left to the modern textile chemist was the severe injunction to keep wool and chlorine as far apart as possible.

Two methods for treatment are available, the first and most important being to pass the cloth through a solution of

450 gals. Water.
9½ gals. Bleaching powder solution, 10° Tw.
5½ gals. Hydrochloric acid, 30° Tw.

After treating the pieces in this solution by simply running them through the vat over and under the rollers, they are washed well

and dried, and are then immediately available for printing.

Each passage requires for re-strengthening about 7 per cent. of the original quantities taken and sufficient water to keep up the volume.

Another method is to pass the goods during one-quarter hour through a bath heated to 165° to 170°, prepared with, for every 10 gallons of water—

8 oz. Hydrochloric acid, 30° Tw.

and then through a cold bath, prepared with 3 to 5 pounds of prime bleaching powder for each 10 gallons of water. Rinse well and dry.

Tanks or vats set apart for this process should be so situated that the constantly arising chlorine fumes will be led to the open air. The stock solutions ought to be prepared in separate vessels, preferably of stoneware.

Too much chlorine turns the wool yellow, and the safest plan is to keep within the quantities given in these formulas although heavy printing shades require stronger chlorine treatment than light shades.

PREPARATION OF THE CLOTH WITH TIN.

This is one of the oldest processes and for many colors is without an equal. The goods are passed through a solution of Stannate of Soda at from 3 to 6° Tw., then rolled up and set aside for one or two hours, afterwards passing through a bath of sulphuric acid at 1½ to 2° Tw.; wash and dry.

It has been found advisable to add to this acid bath a small quantity of bleaching powder solution at 4° Tw., say a pint for each 50 yards of goods.

A combined tin and chlorine process is sometimes recommended, consisting essentially of first treating the cloth in the stannate bath and immediately afterward in the chlorine bath, finishing for printing in the usual manner.

PRINTING AND STEAMING.

The printing is done on a cylinder machine and the fabrics should be brought to the state of actual dryness (not baked bone dry as some printers think necessary for sharp outlines) and then steamed for three-quarters to one hour with low pressure. The duration of the steaming should be regulated by the actual time required to fix the slowest fixing color used. Wash thoroughly and dry.

Color work and the choice of colors for woolen piece goods printing, will be treated briefly in a succeeding article.

## BLEACHING COTTON WARP AND SKEIN YARN.

*BY ROGER WILLIAMS.*

The various operations of bleaching cotton yarn are as follows:

1. Boiling out with alkali.
2. Washing.
3. Chemic at 1 deg. Tw.
4. Washing.
5. Souring with acid at 1 deg. Tw.
6. Washing.
7. Bluing and soaping.
8. Drying on clean cylinders.

There are two methods used in the bleaching of cotton warps and skein yarns. One is to put the yarns or warps into a kier and circulate the bleaching liquor through the fibres until bleached; this is known as the circulation method. The other system is to put the bleaching liquor into the machine and pass the warps through the solution until bleached. As will be seen, these methods are opposite to each other in the manner of working.

The circulation method is that which is now generally employed in all the modern mills on the continent of Europe, in Great Britain and in the United States.

To bleach by either method, the goods are previously boiled out in a kier or boiling machine. During this preliminary boil many bleachers use from three to five per cent. of soda ash, sal soda or caustic soda, being careful, however, to keep the yarn below the surface during the boiling. This is necessary to prevent "tendering" of the fibres.

After boiling, the warps are washed for some time with cold running water and then carried into the bleaching kier, where the bleaching proper is carried out.

The boiled out warps are now run over a reel into a kier where they are packed and

laid evenly by a man or boy until the kier is filled within twelve inches of the top. The centrifugal pump is then started and the kier filled with a stock bleaching liquor made up to 1 deg. Tw. When the warps are covered with this bleaching solution, a valve at the bottom of the kier is opened into a tank con-

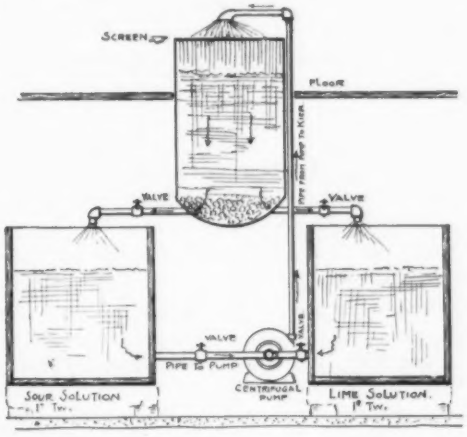



FIG. 1.

taining the stock bleaching liquor, thus obtaining a thorough circulation of liquor through the yarn. This circulation is generally kept up for one hour, then the liquor is allowed to drain back into the storage tank and the warps are washed. The washing is accomplished by simply passing running water in at the top and out at the bottom of the kier for about an hour.

For the next operation, souring, a stock tank is used, filled with sulphuric acid 1 deg. Tw., which is pumped for one hour through the warps. Muriatic acid, bisulphite of soda or anti-chlorine may be used in place of sulphuric acid. After souring, the warps are again well washed for an hour, then soaped and blued. The soaping and tinting are done as the warps are being drawn out of the bleaching kier. For this purpose bleachers use a neutral white chip soap solution, to which a small amount of alkaline blue 4B has been added. Methylene blue can be used instead of the alkali blue, if desired.

Fig. 1 shows the apparatus used for the circulating system. Fig. 2 is the floor plan of a bleach house on the continuous plan. This plant contains many good features, but is not an ideal one because it was built to meet existing conditions as to available land. There is no large boiling kier or boiling machine, as the firm had a boiling machine of sufficient capacity for all purposes. The plan has some very good features, among which are a water filter and a storage tank for water after being filtered, also two small machines for soaping and bluing; these machines also serve to withdraw the warps from the three wooden bleaching kiers shown in the plan. There are also two centrifugal pumps, one to pump the chloride of lime solution and the

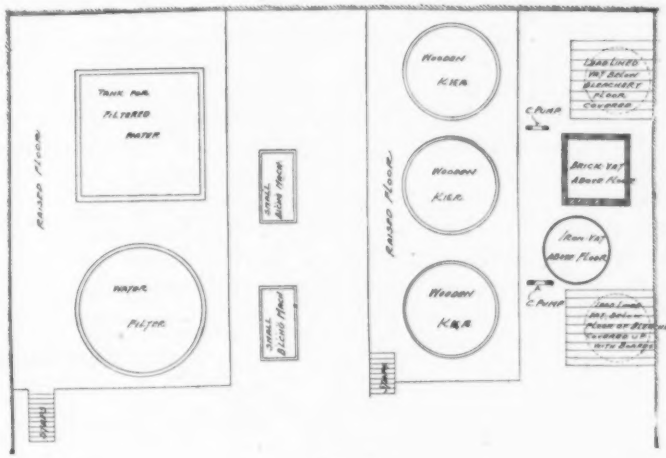



FIG. 2.

other to circulate the acid solution. The two storage tanks shown in the plan are lead lined; one for the chemic, the other for the acid solution.

The brick vat above the floor is for the purpose of making a strong solution of chloride of lime. This stands 8 to 10 deg. Tw., and is used to replenish the stock chemic solution from time to time as it is used or becomes weakened. The small iron vat above the floor is used to boil out skein yarn. The drying of the warps is done in another room removed from the bleach house. The ideal bleaching plant should have the boiling out machines or kiers in the room with the bleaching kiers. The bluing and soaping machines should be arranged so that the warps after passing through the soaping machine can go directly on the drying cans.

If a boiling machine is used for boiling out purposes in preference to a kier, it should be large enough to boil the warps out in one passage through the machine, and to be so arranged that the warps pass directly from the boiling machine into the kier in one continuous run, and save all intermediate handling and breakage.

If a kier is used for boiling it may be of either the high or the low pressure type; it may be either open or closed. The best work can be done under pressure. The boiling out kiers may be constructed of either wood or iron, but in any case must be provided with a vomit pipe and should have sufficient capacity for one day's work.

Bleaching kiers are generally made of wood that is free from knots; some are lined with cement, others with sheet lead, but in the majority of cases they are not lined at all and do good service. The bottom of the kier is covered to a depth of about twelve inches with clean, smooth white stones, through which the water and chemic are allowed to drain.

The centrifugal pumps are of bronze to stand acid and alkali; the connecting piping should be brass, copper or lead. All iron should be covered so as not to cause rust stains. For bluing and soaping, an ordinary one box dyeing machine will answer. It should have brass rollers in the machine and rubber squeeze rolls. The drying cylinders should be large enough to dry all work bleached, and be used for drying bleached goods only if possible. When cylinders are used for both dyed and bleached warps there is more or less trouble with dirty or streaky goods.

The advantages of the circulating system of bleaching are: It costs less for labor; there is a smaller amount of broken warps, which tends to reduce the cost of beaming; by reducing the number of knots it conduces to the making of a better woven fabric.

The other system of bleaching is only used in mills having a small production. The warps are well boiled out in a boiling box having two compartments. The first box is filled with boiling water, the second with cold running water. To the boiling water is added three to five per cent. of soda ash or caustic soda. The warps are passed through the machine once and boiled out in one continuous run. After boiling they are taken to the bleaching machine, which is built like an ordinary dyeing machine, except that it is lead lined and may have more than one compartment. The bleaching liquor is added to the machine and the warps passed through twice. They are then washed well in another machine, soured, and again well washed, then soaped, and blued if desired.

The disadvantages of this system are that the warps are handled a number of times, thus increasing the liability of breakage, and the warps are more likely to be made tender on account of being exposed to the air after the passage through the chlorine and sour baths. The labor cost is higher and the odor of the chlorine is very detrimental to the health of the workmen.

## New Color Cards.

Azo Acid Red B. H. A. Metz & Co., 122 Hudson St., New York.

Two samples of woolen piece goods dyed with different percentages of Azo Acid Red B.

Thiogene Blue B. H. A. Metz & Co., 122 Hudson St., New York.

Six samples of cotton yarn and two of cotton cloth dyed blue with Thiogene Blue B, alone and in combination with other dyes.

Benzo Violet R L. Farbenfabriken of Elberfeld Co., 40 Stone St., New York.

Two samples of bleached cotton cloth dyed with Benzo Violet R L extra.

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Immedial Direct Blue O D. Cassella Color Co., 182 Front St., New York City.

Five samples of yarn, two of cloth and two of loose cotton dyed with Immedial Direct Blue O D.

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Anthracene Acid Black S T; Cassella Color Co., 182 Front St., New York.

This color is used on wool and worsted and the card shows two samples of union Italian warp dyed with Immedial Black and the worsted filling piece dyed with Anthracene Acid Black S T. White stripe effects are obtained by white cotton threads in the warp. There are also two samples of men's wear worsted suitings piece dyed with the same dyestuff and showing white cotton stripes.

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Katigen Black: Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Two samples of cotton yarn dyed black with Katigen Black S W R.

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Polished Yarn; Cassella Color Co., 182 Front St., New York City.

This card shows three samples of polished yarn dyed black with Oxy Diamine Black and Immedial Black. Full dyeing instructions are given with the samples.

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Black and White Effects on Half Silk; Cassella Color Company, 182 Front St., New York City.

This card shows two very attractive samples of Half silk (cotton and silk) fabrics dyed with Immedial Back the cotton having been mercerized before dyeing.

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# DYE RECIPES.

**The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year**

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Recipe No. 129.

## Violet on Woolen Cloth.

Acid Violet 12 B on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Acid Violet 12 B.
(New York & Boston Dyewood Co., 156 William St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at about 100° F., bring to a boil and dye at a boil for about one hour.

Acid Violet 12 B is of especial value in dyeing woolen piece goods, dyes easily level and possesses good fastness to light.

Recipe No. 130.

## Blue on Worsted Yarn.

Alizarine Blue C B W on 100 lbs. of worsted yarn. First mordant the yarn in a bath containing

3 lbs. Potassium Dichromate.
2½ lbs. Tartar.

Enter at 120° F., bring to a boil and mordant at this temperature for one hour. Prepare the dye bath with

5 lbs. Alizarine Blue C B W.
(Sykes & Street, 85 Water St., New York.)

Enter at 140° F., raise to boil and gradually add

5 lbs. Acetic Acid

and dye at a boil for one and one-half hours.

Alizarine Blue C B W is a true alizarine, and may be used as a self color, or in combination with all other alizarines. It gives shades possessing remarkable brilliancy and fastness.

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Recipe No. 131.

## Orange on Worsted Yarn.

Alizarine Orange R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alizarine Orange R.
(Thomas Leyland & Co., 53 India St., Boston.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 160° F., bring to a boil and dye at a boil for one hour. When bath is exhausted, aftertreat for one hour at a boil in a bath containing

3 lbs. Potassium Bichromate.

Alizarine Orange R can be dyed on chrome mordanted yarn, and combined with other alizarine colors in the production of compound shades. Its fastness is excellent.

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Recipe No. 132.

## Blue on Cotton Yarn.

Rhoduline Sky Blue B B on 100 lbs. cotton yarn. First mordant yarn with tannin by thoroughly working for one-half hour in a hot bath containing

2 lbs. Tannic Acid,

and then allowing it to steep several hours, or better over night in the gradually cooling bath.

Wring without washing and then work for one-half hour in a cold bath containing

1 lb. Tartar Emetic.

Wash thoroughly and dye in a bath containing

½ lb. Rhoduline Sky Blue B B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

and

1 lb. Alum.

Enter at 100° F. and dye for ¾ to one hour at a temperature of from 160° to 170° F.

Rhodulin Sky Blue B B possesses very good fastness to light and is very valuable in calico printing.

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Recipe No. 133.

**Black on Worsted Yarn.**

Diamond Black P V on 100 lbs. worsted yarn. Prepare the dye bath with

8 lbs. Diamond Black P V.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
3 lbs. Acetic Acid.

Enter yarn at 140° F., bring slowly to a boil and dye at this temperature for one-half hour.

Exhaust as much as possible by adding

3 lbs. Sulphuric Acid.

Allow bath to cool to 160° F., add

2½ lbs. Potassium Dichromate

and boil one-half hour longer. Wash and dry. When dyeing in copper vessels it is advisable to add a little Ammonium Sulphocyanate.

Diamond Black P V dyes very level, penetrates well, is extremely fast to light and milling, and also to rubbing, steaming cross dyeing and carbonizing. It is one of the very fastest blacks on the market.

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Recipe No. 134.

**Red on Worsted Yarn.**

Azo Acid Red B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Azo Acid Red B.
(H. A. Metz & Co., 122 Hudson St., New York.)
3 to 4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Azo Acid Red B is easily soluble, and its fastness to alkalies is excellent.

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Recipe No. 135.

**Violet on Worsted Yarn.**

Azo Wool Violet 4 B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Azo Wool Violet 4 B.
(Cassella Color Co., 182 Front St., New York)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 100° F., bring to a boil and dye at a boil for one hour.

Azo Wool Violet 4 B is distinguished by its good fastness to light and alkalies, and is not sensitive to acids. It also retains the same shade in artificial light as in daylight. Its fastness to stoving, ironing, steaming and carbonizing is excellent.

Azo Wool Violet 4 B is especially suitable for the production of dark navy blue shades when combined with Azo Wool Blue S E and Cyanole Fast Green C Pat.

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Recipe No. 136.

**Bordeaux Red on Worsted Yarn.**

Guinea Bordeaux B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Guinea Bordeaux B.
(Berlin Aniline Works, 213-215 Water St., New York.)
10 lbs. Glauber's Salt.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Guinea Bordeaux B is extremely fast to light and dyes very level.

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Recipe No. 137.

**Blue on Worsted Yarn.**

Alizarine Blue C R W on 100 lbs. worsted yarn. First mordant the yarn in a bath containing

3 lbs. Potassium Dichromate.
2½ lbs. Tartar.

Enter at 120° F., bring to a boil and mordant at this temperature for one hour. Prepare the dye bath with

5 lbs. Alizarine Blue C R W.
(Sykes & Street, 85 Water St., New York.)

Enter at 140° F., raise to a boil gradually, add

5 lbs. Acetic Acid

and dye at a boil for one and one-half hours.

Alizarine Blue C R W is a true alizarine and may be used as a self color, or in combination with all other alizarines. It gives a shade possessing remarkable brilliancy and fastness.

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Recipe No. 138.

**Blue on Cotton Yarn.**

Chlorine Blue B on 100 lbs. o coton yarn. First mordant the yarn with tannin by thoroughly working for one-half hour in a hot tannin bath containing

10 lbs. Sumac

and then allowing it to steep several hours, or better, over night, in the gradually cooling bath. Wring without washing, then work for one-half hour in a cold bath containing

2 lbs. Tartar Emetic.

Wash thoroughly, then dye in a bath containing

1 lb. Chlorine Blue B.
(A. Klipstein & Co., 122 Pearl St., New York.)

and

½ lb. Acetic Acid.

Entering at 100° F. and dyeing for one hour at 160° to 170° F. Wash and dry.

Chlorine Blue B is very fast to chlorine and boiling soap.

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Recipe No. 139.

**Scarlet on Silk Yarn.**

Silk Scarlet T on 100 lbs. silk yarn. Prepare the dye bath with

5 lbs. Silk Scarlet T.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter cold. raise to a boil in half an hour, and continue boiling for half an hour. Lift and wash well.

Silk Scarlet T levels and exhausts well and possesses good fastness to light. It is a fine fiery scarlet and on being stoved becomes brighter and slightly yellower in shade. If dyed in copper tanks the shade is much duller.

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Recipe No. 140.

**Blue on Worsted Yarn.**

Domingo Blue N on 100 lbs. worsted yarn (after treated.) Prepare the dye bath with

4 lbs. Domingo Blue N.
(C. Bischoff & Co., 88 Park Place, New York.)
15 lbs. Glauber's Salt.

Enter the yarn at 170° F., bring to a boil and dye at a boil for one-half hour, then add

3 to 5 lbs. Acetic Acid

and boil one-half hour longer and add

1 lb. Sulphuric Acid,

which should exhaust the dye bath in a few minutes.

Then after treat for one-half hour in the same bath to which has been added

2 lbs. of Potassium Dichromate.

Domingo Blue N stands washing exceedingly well and is fast to sunlight and when after treated is rendered fast to milling.

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Recipe No. 141.

**Black on Woolen Cloth.**

Azo Merino Black 6 B on 100 lbs. woolen cloth. Prepare the dye bath with

6 lbs. Azo Merino Black 6 B.
(Cassella Color Co., 182 Front St., New York.)
15 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter goods hot, bring to a boil and boil until the color is exhausted.

Azo Merino Black 6 B possesses valuable properties, the principal advantage over others being that they dye perfectly level in a strong acid bath and penetrate well, giving a full bloomy shade resembling very closely a logwood black. The color does not change with artificial light and its fastness to light, alkali and crocking is very good.

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Recipe No. 142.

**Dark Pink on Worsted Yarn.**

Eosamine B on 100 lbs. worsted yarn. Prepare the dye bath with

½ lb. Eosamine B.
(Berlin Aniline Works, 213-215 Water St., New York.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Eosamine B is extremely fast to light, and dyes very level.

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Recipe No. 143.

**Green on Cotton Yarn.**

Direct Green B on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Green B.
(E. M. Thayer & Co., 106, 112 Broad St., Boston.)
20 lbs. Glauber's Salt.

Enter at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Direct Green B is very fast, for a direct cotton color, and is very useful for shading, when a bright green is desired.

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Recipe No. 144.

**Salmon Red on Cotton Yarn.**

Tetrazo Salmon R on 100 lbs. cotton yarn. Prepare the dye bath with

½ lb. Tetrazo Salmon R.
(New York & Boston Dyewood Co., 156 William St., New York.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Tetrazo Salmon R when used in low percentages gives excellent shades of salmon pink. It possesses the characteristic properties of the direct cotton colors.

# Mill News.

## COTTON.

**New Mills.**

Alabama, Sylacauga. A yarn mill is to be built by T. J. Matthews, proprietor of the Marble City Hosiery Mills, for purpose of furnishing yarn for the knitting plant, equipped with 24 knitting machines. Makes cotton hose and half hose.

*Alabama, Sylacauga. The new yarn mill to be built by T. J. Matthews, proprietor of the Marble City Hosiery Mills, equipped with 98 knitting machines, will be capitalized at $75,000.

Georgia, Athens. The Bailey-Arnold Manufacturing Company has recently been organized for purpose of manufacturing cotton rope, cords, sacks, towels, etc. Thomas Bailey of Athens and O. H. Arnold of Lexington are interested.

*Georgia, Macon. Work will start at once on erection of new building for the Edward Wolff Cotton Waste & Linter Co., which expects to have same completed in about six months. Capital stock is placed at $5,000. Edward Wolff is president and treasurer of the concern. Will manufacture cotton felt, batting and waste products.

*Georgia, Neal. The Neal Manufacturing and Power Company has been incorporated with a capital stock of $500,000. H. B. Neal is president and treasurer, and Andrew J. Kelley, agent, and will start work on building September 1st. They expect to have plant ready for manufacturing sheetings sometime in April or May, 1904. Will equip same with 30,400 ring spindles and 1,000 looms, operating same by electricity. This company will also develop water power at Flat Shoals, Georgia; 6,500 H. P. to be sold to mills in this locality. Have not yet contracted for any machinery.

*Louisiana, Shreveport. The Shreveport Cotton Mill Co. expects to have the new addition to be built completed by spring, 1904. They propose installing 20,000 ring spindles and 600 looms in same.

*Massachusetts, Fall River. The Watuppa Mills, recently reported incorporated at Providence, R. I., will be located in this city, on land between the Stevens Mfg. Co.'s plant and the Fall River Bleachery. It is proposed to build a plant for weaving and finishing fancy cotton cloths, purchasing yarn. After a line of trade has been established they propose erecting a spinning mill. William B. Edgar is actively interested in the project.

Massachusetts, Methuen. The Tekcips Manufacturing Co. is a new concern recently started near the Tremont Worsted Mill for manufacturing ginghams. James H. Wolger, of the Methuen Cotton Mill is interested in the new concern.

*New York, Gouveneur. Three looms have already been set up in the International Lace Co.'s plant, and as soon as the fourth has been placed operations will be started, making Nottingham curtains. The other machines will then be started as rapidly as received.

*North Carolina, Durham. The increase recently made in the capital stock of the Edwin Cotton Mills and vote for issue of $1,500,000 worth of new stock, is to provide for cost of new mills under construction at Duke. These mills are to be equipped with 35,000 spindles and 1,200 looms.

*North Carolina, Gibsonville. The main building of new cotton mill to be built by the Minneola Manufacturing Co., will be 296 by 130 feet. There will also be a picker house, dye house, boiler and engine room, etc.

*North Carolina, Greensboro. W. I. Young, Atlanta, Ga., is at the head of project underway for building a $250,000 cotton mill at this place. They will manufacture special cotton textile fabrics. They propose increasing the capital stock to $500,000 shortly after starting operations.

*North Carolina, Springhope. J. J. Saunders is president of the Cotton Oil Mill Company, recently organized with a capital stock of $30,000 and interested in the erection of a cotton mill for spinning.

Pennsylvania, Philadelphia. Henry Goldthorp has just started up in the manufacture of curtains and upholstery goods on the fifth floor of the Ontario Mills, 1738 North Second Street. Mr. Goldthorp was formerly a selling agent for this class of goods and is well acquainted with the business. Downtown office is 74 Hale Building, 12th and Filbert Streets.

*Pennsylvania, Philadelphia. Harry D. B. Clapp is president of the firm recently incorporated as Harry D. B. Clapp & Co. M. Kendrick is treasurer of the concern.

Pennsylvania, Philadelphia. Mustin Davis & Co., 304 to 8 Master Street, manufacturers of curtains, couch covers and piece goods, report being very active. The company does their own superintending selling their goods direct and through New York. They operate 4 looms, 2 winders and 2 sewing machines, and expect to put in new looms during the coming season.

*Pennsylvania, Philadelphia. The Delta Spinning Company has been incorporated to take over and operate the old Wingohocking Mills, of Frankford, Philadelphia. The entire equipment of the plant has been changed and the new machinery is now being set up and it is expected to be partly in operation within a week or two. The production of this concern will be fine combed Egyptian yarns and will start up with 150 hands. The mills occupy 80,000 square feet with two engine rooms and an electric light plant is now being installed. When in operation this will be one of the finest and largest mills in the country. Mr. Garsed is superintendent.

Pennsylvania, Philadelphia. The Delta Spinning Mills have made application for a charter, for

spinning cotton, doubling yarns, etc. William Bault, Charles E. Titman and Edward Cadwallader are interested.

*Rhode Island, North Smithfield. The contract for erection of the Blackstone Manufacturing Company's new mill has been let to the B. F. Smith Company, of Pawtucket. Ground was broken this week for foundations and work will be pushed on construction of the plant.

Rhode Island, Providence. The Star Hair Cloth Co. has been incorporated with a capital stock of $24,000 for the purpose of manufacturing hair cloth. Frank Bacon, John Arthur McAllen and Phillip C. Sheldon are interested.

Rhode Island, Providence. The Monnahansett Spinning Company, a new concern, is reported as having a large number of orders on hand which will necessitate night work.

*South Carolina, Pendleton. The Pendleton Cotton Mills will equip their plant with 3,120 spindles, for manufacturing yarns. A building, 120 by 75 feet, will be erected.

South Carolina, Williamston. A new mill to be erected by the Williamston Cotton Mills Co. will be 160 by 77 feet, two stories, and will be equipped with machinery for manufacturing same goods made at present.

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**Enlargements and Improvements.**

*Alabama, Anniston. The Anniston Manufacturing Co., whose plant has been closed for the past month for repairs, will restart same as soon as a supply of cotton can be secured. The capacity of the plant has been greatly increased.

*Alabama, Huntsville. The Madison Spinning Mills have completed addition to the plant in which 5,000 additional spindles will be placed. The entire plant will be put in operation this fall.

California, Oakland. A new storage warehouse, 100 by 30 feet, brick, is to be built for the California Cotton Mills Company.

Georgia, Carrollton. The Mandeville Cotton Mills have suspended operations for a few weeks, for purpose of installing additional weaving machinery. It is thought that it will take several weeks to complete installation.

Georgia, Harmony Grove. Operations have been suspended in the Harmony Grove Cotton Mills on account of raw material supply. They will resume operations in September, when the new cotton crop is received.

Georgia, Macon. An addition is being built for the Willingham Cotton Mills for increasing the machinery capacity. The order has been placed with Crompton & Knowles Loom Works for the additional machinery to weave heavy numbered duck and canvas, 120 inches wide.

Georgia, Pelham. The Pelham Cotton Mills will instal 70 new looms. They are also considering plan to build an extensive addition and increase capacity in all departments at an early date.

Georgia, Quitman. It is reported that the Atlantic & Gulf Cotton Mills propose building a large addition and installing a considerable amount of new machinery.

Georgia, Thomson. The J. E. Smith Manufacturing Co. is considering enlarging the mill, now equipped with 3,120 ring spindles.

*Georgia, Thomaston. The Thomaston Cotton Mills advise us that they are to increase the capital for purpose of enlarging the plant, but are not yet ready to make any announcements. They have not decided on the kind of production.

*Massachusetts, Fall River. The Luther Manufacturing Company, capitalized at $350,000, succeeds the Robeson Mills. Work has begun on the erection of a new weave shed. They will install about 20,000 spindles in the plant, which will give them a total when completed with additional looms, of about 42,000 ring spindles and 1,000 looms. Leontine Lincoln is President of this concern and Charles B. Luther, Treasurer.

Massachusetts, Fall River. A meeting will be held August 17th by the stockholders of the Bourne Mills for the purpose of voting on proposition to increase the capital stock to $1,000,000. This plant is now equipped with about 87,000 spindles and 2,700 looms, making twills and sateens.

Mississippi, Tupelo. At the annual meeting held recently by the stock-holders of the Tupelo Cotton Mills, it was resolved to issue $40,000 worth of additional stock for the purpose of installing improvements and enlarging the capacity of the plant.

North Carolina, Cooleemee. The Cooleemee Cotton Mills are to increase the capital stock from $500,000 to $1,000,000 for purpose of making enlargements.

*North Carolina, Durham. The Erwin Cotton Mills Co. advise us that their charter has been recently amended, authorizing increase of capital stock from $500,000 to $3,000,000. It is proposed to build new mills with this increased capital, No. 2 mill, at Duke, being well under way.

North Carolina, Gastonia. The Gastonia Cotton Mills are installing 135 new looms in the plant, which will give them a total of 270 when completed. Fifty of the new looms have already been placed and put in operation.

North Carolina, Harden. Machinery, including 3,500 additional spindles is being installed in the new addition recently completed by the Harden Mfg. Co.

*North Carolina, Hillsboro. The Eno Cotton Mills, previously reported to build a weave shed, will instal 450 looms in same for making ginghams. This plant is equipped with a dye house. Goods are to be sold through Frederick Vietor & Achelis.

North Carolina, Hillsboro. The Eno Cotton Mills are reported to build a weave shed for utilizing their yarn production. Plant is now equipped with 10,000 ring spindles.

*North Carolina, Hope Mills. Work is nearing completion on the improvements under way to the

Hope Mills Manufacturing Co.'s plant. The new machinery will soon be in operation.

North Carolina, Kings Mountain. It is reported that the Cora Cotton Mills will build an addition and install considerable new machinery in same.

North Carolina, Lincolnton. An addition is being built to the Lincoln Cotton Mills for a machine shop.

*North Carolina, Lumberton. Work has been started on new addition to be built for additional machinery to be installed in the Lumberton Cotton Mills.

North Carolina, Oxford. The Oxford Cotton Mills have increased the capital stock from $125,000 to $175,000, for purpose of installing additional machinery in the plant and otherwise improving same.

North Carolina, Spray. The Morehead Cotton Mills will make some extensive improvements to the plant. They will install about 4,000 spindles with complementary machinery, for making fine yarns.

*North Carolina, Worthville. The Worth Cotton Mills Co. will change their class of goods from white to colored and additional buildings will be erected for the purpose. New machinery will also be added.

Pennsylvania, Frankford. Messrs. Landis & Allen, located in the Wolstencroft building, report that they are very busy manufacturing damasks on six looms. Mr. Allen states that he is now making ready for six more looms, which he will put in in a short time.

Pennsylvania, Philadelphia. D. Wall, located in the Wolstencroft Mill, reports that up to date he has been very busy. He has just taken down four old Mutual looms which he contemplates replacing with Crompton Knowles looms for making the same class of goods. Manufactures damasks. Mr. Wall was formerly a member of the firm of Wall and Davies.

Pennsylvania, Philadelphia. Messrs. Reagi & Jeram, 4155 Frankford Avenue, manufacturers of cords for lace curtain manufacturers and bonnet wire, report that they are away behind in their orders. They are now having a large winder for magnet wire built, but would be glad to hear from other manufacturers of the same class of machinery. They also state that in the near future it is their intention to put in some braiders.

Pennsylvania, Philadelphia. A three story building, 467 by 401 feet, three stories, and basement, is to be built for the American Lace Manufacturing Co.

Pennsylvania, Trainer. The Trainer Spinning Company is running along full time on combed Egyptian and peeler yarn. They are just now putting in nine new speeders built by the Saco & Pettee Machine Shops. Mr. William E. Trainer is the superintendent and has for his assistants, Edward Burke, overseer of card room and Henry Fulton overseer of spinning. The company employs about 100 hands.

*South Carolina, Clifton. Work is progressing rapidly on the rebuilding of mills No. 1 and No. 2 of the Clifton Manufacturing Co., which were destroyed by the flood last June. The question of rebuilding mill No. 3, also destroyed, has been left entirely to A. A. Twitchell, the company's president.

South Carolina, Fairmont. The Tyger Cotton Mills are installing 2,000 additional spindles and 80 looms in the plant. This will give them a total of 8,144 spindles and 256 looms.

*South Carolina, Hartsville. Contract has been let for the new addition for the Hartsville Cotton Mills. The building will be 141 by 130 feet, four stories, and will be equipped with 23,000 spindles and 750 looms, giving, when completed, a total of 35,000 spindles and 1050 looms in the plant. They expect to have all the machinery in operation by next March.

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**Mills Starting Up.**

*Connecticut, Oakdale. Palmer Bros. have completed equipping their branch mill at this place and put same in operation.

*Maine, Lisbon. Operations have been resumed by the Farwell Cotton Mills, after shut down of two weeks.

Massachusetts, Amesbury. Operations have been resumed in the Hamilton Cotton Mills, after shut down of one week. It is not known at present whether any further curtailment will be made.

*Massachusetts, Chicopee Falls. Operations will not be resumed until Aug. 31st, in the Chicopee Mfg. Co.'s plant. Delay in repairs on the canal is reason for extended shutdown.

Maryland, Bay View. Operations have been resumed in the Providence Woolen Mills (Daniel Turner, owner). Plant has been idle for some little time.

Massachusetts, New Bedford. The Bristol Mill which closed down August 8th will resume operations on the 17th inst.

*Pennsylvania, Philadelphia. Mr. H. Goldthorp who has recently started manufacture of cotton and silk draperies in the Ontario Mills, 2nd Street above Columbia Avenue, will operate in all 20 Crompton & Knowles looms, 10 of which are now running. All the machinery in this plant is new and up to date. Mr. Goldthorp proposes enlarging the plant as business increases.

*Rhode Island. Forestdale. Operations have been resumed in the Forestdale Manufacturing Co.'s plant, which has been closed for a week.

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**Mills Shutting Down.**

Connecticut, Middletown. The mills of the Russell Manufacturing Co. at Rockfall and Higganum have been closed on account of the scarcity and high price of cotton.

Georgia, Tifton. The Tifton Cotton Mills have been closed temporarily.

Indiana, Evansville. The Evansville Cotton Mill has been closed indefinitely.

Maine, Augusta. The Edwards Manufacturing Co.'s plant has been closed for a month. Repairs will be made to the machinery during shut down. It is reported that date of starting depends on condition of the cotton market.

Maine, Brunswick. Operations have been suspended in the Cabot Cotton Mill until Aug. 31st.

Maine, Brunswick. The Cabot Cotton Mills have shut down for two weeks, during which time necessary changes will be made in the plant, also some repairs to the water wheels.

Massachusetts, Chicopee. The Chicopee Manufacturing Co. has closed the plant until Aug. 24th. A break in the wall of the canal that supplies water power of the mills, is the cause for shut down.

Massachusetts, Fall River. The Flint Cotton Mills will be shut down for two weeks on account of strike of doffers and the cotton market.

Massachusetts, Fall River. The Sagamore Mill No. 2, has been closed this week and the No. 1 mill put in operation. The Border City No. 2 and No. 3 mills resumed operations on the 10th, but the No. 1 mill is continued shut down.

Massachusetts, Pittsfield. The Pittsfield Cotton Mills have been closed for one month for the purpose of installing a new water wheel and an electric lighting plant.

Mississippi, Water Valley. The Yocona Mills have been shut down on account of scarcity of cotton.

New Hampshire, Exeter. The Exeter Cotton Mills are to be closed August 8th and will remain shut down for four weeks. The finishing rooms will be idle a fortnight. The Pittsfield Mills leased by the Exeter Manufacturing Co., Exeter, N. H., at Pittsfield, N. H., will also shut down for several weeks.

New Hampshire, Suncook. The China, Webster and Pembroke Manufacturing Companies at this place will close their mills on August 8th and resume operations on August 24th.

*Pennsylvania, Philadelphia. The plant of the Arkonia Manufacturing Co., recently reported assigned, has been closed.

Rhode Island, Forestdale. The Forestdale Manufacturing Company's mills at this place have been closed during the past week on account of the high price of raw material.

*South Carolina, Bamberg. The Bamberg Cotton Mill has been shut down for extensive repairs and improvements and will resume operations in about a month.

South Carolina, Columbia. The Olympia and Granby Mills were shut down on the 12th inst., but will resume operations on the 17th. The machinery is to be given a general overhauling.

## WOOLEN.

### New Mills.

Maine, Augusta. The Hogg Carpet and Mfg. Co. has been organized with a capital stock of $1,500,000 for manufacturing carpets and other fabrics. J. Berry of Augusta is president of the company and Jos. Williamson, treasurer.

*Massachusetts, Holyoke. The International Felting Company is a new concern recently organized for the purpose of manufacturing fine felts. William Taylor is president, Charles Vaght vice-president, and F. W. Harrison, treasurer. The mill has not yet been started.

Massachusetts, North Oxford. The Huguenot Mills Co. has been incorporated to operate the old plant of the Huguenot Mills, and is to run same as an 8-set woolen mill. T. M. Gates is president of the company; Geo. H. Wilson (Providence), treasurer and Geo. A. King (Worcester) secretary.

*New Hampshire, Laconia. Albert Crabtree, manager of the Laconia Woolen Co., advises us that company will be incorporated in a few days. They are in the market for considerable machinery.

*New Hampshire, Laconia. The Laconia Woolen Company has been incorporated with capital stock of $50,000. Hiram Thomson is president of the company and Horace Mitchell, treasurer.

*New Jersey, Camden. Casey & Lund, at the foot of Third Street, manufacturing worsted yarns, are now in full operation. Their samples have been placed on the market and they are now receiving orders.

*Pennsylvania, Chester. The Powhatan Manufacturing Company, manufacturers of woolen goods in the Esrey Mills, expects in a short time to be in full operation. The concern consists of H. L. Trafford, C. M. Benson and C. W. Andrew; Mr. Benson acting as the superintendent. They are very busy and at the present time are putting in new cards which are now on the grounds.

*Pennsylvania, Harrisburg. The new plant of the Harrisburg Woolen Co., which contemplates starting operations by October 1st, will be equipped with 2 sets cards and 18 looms, for manufacturing blankets and flannels. A one-story building, brick and stone, will be built for dye house. Frank R. Leib is president of the company; B. F. Ely, secretary and treasurer and Wm. Roebuck, superintendent.

*Tennessee, Springfield. The foundation has been completed for the new building, 50 by 60 feet, to be erected for the Springfield Woolen Mills Co. They propose having mill in operation by spring, manufacturing blankets, yarns, linsays, and other woolen goods.

### Enlargements and Improvements.

Canada, St. Jacob's. It is reported that the Canada Felting Co. contemplates putting in some cards.

*Georgia, Rossville. Work is almost completed on the new addition to the Park Woolen Mills. The new machinery has been received, and is ready to be installed in the plant. A large number of additional people will be employed.

*Maine, Dexter. The Dunbarton Woolen Mills, recently incorporated to operate the Stone Mill, will tear down the dye house and erect an entirely new one.

Maine, North Berwick. The old dye house of the North Berwick Company has been torn down and preparations are being made for erecting a new one. Work will probably start on construction in a couple of weeks.

Maine, Madison. The Madison Woolen Mill is making preparations for extensive repairs to be made to the plant, which will be closed about the middle of August for the purpose. The old wooden flumes are to be replaced with stone, a new water wheel put in, and the wheel-house building repaired. As soon as repairs have been completed, the plant will be started up in full.

Maine, Springvale. The Maine Alpaca Company has purchased the undeveloped water privileges on the Mousam River, between the upper end of the Alpaca mill pond and Jordan's lower mill, but will take no immediate steps to develop them.

Maine, West Buxton. A new picker house, 24 by 50 feet, two stories high, is under construction for the Saco River Woolen Mills. A rag picker will be installed for manufacturing their own shoddy.

Massachusetts, Enfield. A number of repairs and improvements have been made to the Enfield Manufacturing Co.'s plant. The looms have been changed over for the business of the coming season.

Massachusetts, Lawrence. George L. Selden manufacturing fine worsted dress goods, has recently started nine additional looms at his mill.

Massachusetts, Lowell. The Middlesex Company has closed the plant for two weeks or more, for purpose of making necessary repairs and adding new machinery, etc. It is hoped to have the plant in full operation by August 24th.

Massachusetts, Oxford. An addition is being built to the card room of A. Howarth & Sons' mill. Various changes and improvements will be made giving the mill facilities for an increased output; a 160 jack spindle will be replaced with 240 spindle mules.

New Hampshire, Pencook. The Dustin Island Woolen Mills, which have recently installed two new looms, are building an addition to the dye house.

*Massachusetts, Palmer. The Palmer plant of the Grosvenor Woolen Co. is not to be removed to Holyoke. The plant at Holyoke has been enlarged and the Palmer plant is to be kept in operation. New carding machinery is being installed.

Massachusetts, Pittsfield. A 25 foot addition is being built to the sewing room of the Pontoosuc Woolen Mfg. Co's. mill. The gigs are being removed from the finishing room to make room for two new jacks to be set up.

Massachusetts, Pittsfield. The Tillotson Mills, which are running overtime, contemplate installing several hundred dollars worth of new machinery within a few months.

Massachusetts, Quinapoxet. Extensive improvements are to be made to C. G. Wood Co.'s mill. They propose building a new boiler house, dye house and enlarge the weave shed.

New Jersey, Camden. The John Lunn Company at Cramer Hill is now in full operation. The officers of the company are as follows: president, John Lunn; vice-president, A. G. Lunn and E. S. Lawrence, secretary and treasurer. The company is scouring and carbonizing wool with two sets scouring machines and two sets of carbonizing machines, with pickers, etc. They are very busy, Mr. A. G. Lunn, the superintendent, states, and will put in another set of scouring machines and two new dryers. They now turn out 15,000 pounds of scoured and 6,000 pounds of carbonized stock a day. The capacity of the plant will be doubled when the new machinery is placed in operation.

New Hampshire, Tilton. A rag picker and four looms have recently been installed in the Carter Mill.

*Oregon, Eugene. The Willamette Valley Woolen Manufacturing Company, recently reported increasing the capital stock to $100,000, will install additional machinery in the plant. Now operate four sets of cards and twenty-six looms.

Pennsylvania, Philadelphia. Harvey Quicksall who has been located at 4274 Paul Street, has removed to a new one story corrugated iron building at the corner of Dyer & Willard Streets, Frankford. Mr. Quicksall manufactures shoddy on commission.

Pennsylvania, Philadelphia. In conjunction with their plant at Hart Lane and Emerald St., Messrs. John F. Lodge & Sons, manufacturers of cotton and wool carpet yarns, have for many years also run a mill at Bustelton, Pa. They have now decided to consolidate the two factories and the machinery in the Bustleton mill is being shipped to the Philadelphia mill, where it will be put in operation.

Pennsylvania, Philadelphia. The Yorkshire Worsted Mills are very busy on their spring lines of cotton and worsted goods, samples of which were sent out to the trade a short time ago. Several very heavy orders have been received, one firm alone ordering over 1000 pieces. The company reports being sold up to date. 170 looms are run on these goods, Mr. S. J. Greer being the superintendent. They also state that they are now contemplating the enlargement of their plant and are desirous of purchasing about 40 second-hand Knowles "Gem" looms which they can put to work at once. This company at the recent sale of the Rhodes Mill, Lenni, Pa., bought up their entire stock. The downtown office is at 10 North 3rd Street.

Pennsylvania, Philadelphia. A report is current to the effect that William Henderson, manufacturer of ingrain carpets at the corner of Mascher & Oxford Streets, will remove at an early day to Bristol, Pa., where they will occupy the factory formerly owned by the Providence Knitting Mills.

*Pennsylvania, Reading. J. G. Leinbach & Co., have recently incorporated as the J. G. Leinbach Company with capital stock of $200,000, and will start manufacturing clothing in addition to present business.

# Personals.

## PERSONALS.

**Cotton.**

F. G. Bertrand of Louisville, Ky., has taken the superintendency of the Standard Mills, Cedartown, Ga.

Chester J. Brown, overseer of carding in the Merchants Mill, Fall River, Mass., has resigned on account of ill health.

W. D. Barber, superintendent of the Dexter Yarn Co., Pawtucket, R. I., for the past year and a half, has resigned. Charles E. O'Gara has succeeded him.

A. E. Hall, superintendent of the Bala Mill, Concord, N. C., has resigned, and engaged with the Magnolia, Miss., mills. Charles S. Smart, formerly boss carder at Bessemer City, N. C., succeeds him.

Benjamin Leavitt has severed his connection with the Eureka Silk Mfg. Co., of Canton, Mass., after 25 years' service.

L. B. Reed has been promoted to overseer of spinning at the Chadwick Cotton Mill, Charlotte, N. C.

Samuel D. Learned, for many years connected with the Lonsdale (R. I.) Co., has resigned, and intends to live in retirement.

H. P. Carter, formerly superintendent of weaving at the St. Croix Mill, Milltown, N. B., is now superintendent of the Edwards Manufacturing Co., Augusta, Me.

J. H. Brown has resigned his position as loom fixer with the Gaffney (S. C.) Mills, to accept position as assistant overseer of weaving with the Greenville Mills, Greenville, S. C.

E. N. Tart is the new superintendent of spinning at the Altamahaw Cotton Mill, at Elon College, N. C. Mr. Tart had been night superintendent at the Roxboro Cotton Mill (N. C.) for some time previous to coming to Elon College.

A. J. Brown, formerly overseer of weaving at the Fairfield Cotton Mills, Winnsboro, S. C., is now in charge of weaving at the Greenville (S. C.) Mills.

W. T. Bell, formerly loom fixer at the Modena Mill, Gastonia, N. C., is now overseer of weaving at the Dallas Cotton Mill, Dallas, N. C.

C. A. Horne, overseer of weaving at the Exeter Mfg. Co., Exeter, N. H., has resigned.

James Cox, of the Hargraves Mill, has succeeded William S. Gay as overseer of weaving at the Flint Mills, Fall River, Mass.

Walter Wright, formerly connected with the Quaker City Dye Works, Philadelphia, Pa., is now superintendent of the Chester Manufacturing Co., Chester, Pa.

The Chester Manufacturing Company, manufacturers of table damask, Turkish towels, tickings and coton yarns, have made a change in their superintendent, Mr. Bartholomew being no longer connected with the establishment.

M. D. Sawtelle has resigned as overseer of spinning at the Danielson Cotton Co., Danielson, Conn.

J. W. Bond, formerly of the Dover Cotton Mill, Pineville, N. C., has been appointed overseer of the cloth room at the Orient Mills, Charlotte, N. C., to succeed M. L. Sherrill, resigned.

Richard Charlton, boss finisher at the Southbridge Print Works for the past ten years, has resigned to accept a similar position at the Silver Springs Bleachery at Providence, R. I. John Cooney, who had charge of the back filling, has also resigned to go to Providence to work for the same concern.

Eber Hill, superintendent of the Namquit Mill, Bristol, R. I., has sent in his resignation to take effect September 1st. Mr. Hill has accepted the position of manager of the Dixon Lubricating Saddle Co. Mr. Hill has been connected with the Namquit Mill for a period of twenty-five years. For the past thirteen years he has been superintendent, succeeding the late Messadore T. Bennett.

E. E. Bartlett has accepted superintendency of a cotton mill in Aurora, Ill. He has been instructor of carding and spinning at the New Bedford Textile School. A silver loving cup was presented to him by his former colleagues at the school.

Joseph W. Bean, who has been foreman in the Manchester Mills Corpn., for the past 45 years, has retired. Mr. Bean is 75 years of age.

Walter W. Wood, who has been with the Delgado Mills, Wilmington, N. C., for a number of years, has been appointed to position of superintendent of the plant.

John Newberg is now overseer of weaving at the Merrimack Manufacturing Co.'s Mill, Lowell. He was formerly with the Boott Mills, in similar position.

C. L. Hutchinson has resigned as superintendent of the Bellevue Cotton Mills, Newport, Tenn. He has accepted position with one of the Cone Mills, at Greensboro, N. C.

James G. Grant has tendered his resignation as superintendent of the weaving department of the Thorndike Company's mill, West Warren, same to take effect Sept. 1st. Mr. Grant has been employed by the firm continually since 1869.

Charles M. Holmes, superintendent of the Natick Mills, has resigned to accept the entire control as agent and manager of the Manomet Spinning Co.'s plant at New Bedford, Mass. This is a new concern, and the plant to be erected will be built especially for the manufacture of combed hosiery yarns.

**Woolen.**

M. J. Burke has resigned as finisher for Rockwell & Co., Rockwell Mills, N. Y.

J. Broadhead has resigned as designer for the Globe Woolen Co., Utica, N. Y.

Joseph A. Day, overseer of carding for the Beebe-Webber Co.. Holyoke, Mass., has resigned, and accepted a similar position in Pittsfield, Mass.

John Keenan has resigned as overseer of worsted spinning for the Woonsocket Worsted Co., Woonsocket, R. I.

D. O. A. Latimer, boss finisher for the Success Worsted Co., North Chelmsford, Mass., has resigned.

James Lockwood has resigned as boss dyer at the Singleton Worsted Mill, Franklin, Mass., and has been succeeded by J. R. Emmett.

William T. Lockett, designer and overseer of weaving at the Vernon Woolen Company, Rockville, Conn., has resigned, and goes to Philadelphia. John Lockett, his father, will succeed him.

Daniel McGuire, overseer at Bellevue Mills, Clinton, Mass., has resigned, and is now one of the overseers at the Clinton Worsted Co.

John McGuire of Blackstone, Mass., has taken charge of finishing in the Atlanta Woolen Mills, Atlanta, Ga.

George Peck, Rochester, N. Y., is now with the Seneca Woolen Mills, Seneca Falls, N. Y.

James T. Sanderson, Charleston, W. Va., has been appointed general superintendent of the Terra Alta (W. Va.) Woolen Mills.

Emil Schmidt has returned to Bedford City, Va., to take charge of weaving at the Bedford Mills Co.

P. Sheridan has taken charge of carding in the Hudson River Woolen Mills, Newburgh, N. Y.

Joseph Hall, boss weaver, has resigned his position with the Neponset Woolen Mill, Canton, Mass.

Thomas Goggan has succeeded James Newns as overseer of spinning at the Dawson Mfg. Co.'s Mill, Holden, Mass.

James Farnell has been engaged as dyer in the Portland (Ore.) Woolen Mills.

Massachusetts, Fall River. John J. Walsh has resigned his position as superintendent of the Wickford Worsted Mills, Wickford, R. I.

John Percival, overseer of spinning at Talcott Bros., Talcottville, Conn., has resigned.

Thomas Holmes is now the boss dyer at Thomas Caves & Sons carpet mill, 3rd and Cumberland Streets, Philadelphia.

James A. Snow has resigned position with Senior & Singleton, Medway, Mass., as second hand of dyeing.

Joshua Broadhead, designer for the Globe Mills, Utica, N. Y., has resigned.

Edward D. Dudley has recently accepted the position of boss weaver for the Dalton (Mass.) Woolen Mills.

George Park, who has been superintendent of the Airlie Mills at Hanover, Conn., for four years, has bought an interest in the Penobscot Woolen Mill at Dexter, Me., and has been appointed manager of same.

C. F. Pfliegl, recently overseer of carding and spinning at the Columbus (O) Woolen Mills Co., is now in charge of spinning at the Springfield (Ill.) Woolen Mills.

Charles Pinkston has resigned his position as boss carder of the Dalton Woolen Mill, to accept a position at Clinton, Mich.

George Spencer has resigned as superintendent of the Megunticook Woolen Co., Camden, Me., and with his family will move to Philadelphia.

Wylie Wright has resigned his position as overseer of carding at the Rochester Woolen Mill, Rochester, N. H. He was presented with a gold watch and charm by his help.

James Mulligan, boss weaver at the Faulkner Woolen Mill, Stafford Springs, Conn., has resigned, to accept a similar place in Providence.

New York, Fultonville. W. H. Hodgson has recently resigned his position as designer with the Fulton Mills and taken a similar one at the Globe Mill, Utica, N. Y.

James F. White has resigned his position with the J. L. & T. D. Peck Manufacturing Co., and accepted position in charge of night spinning and carding at the Pontoosuc Co.'s plant. He has been connected with the spinning department of the Peck Mills for the past fifteen years.

Fred Teel has resigned as boss weaver at the Vassalboro Woolen Mill, and accepted a similar position in the Skowhegan Worsted Mill.

Edwin F. Lovejoy, superintendent of the Ray Fabric Mills, at Unionville, Mass., has tendered his resignation, to take effect Sept. 1st.

John H. White, from the State of Rhode Island, is the new overseer at the No. 1 Mill of the Mann & Stevens Woolen Co., East Brookfield, Mass.

John Kinneburgh, has resigned his position as overseer of dyeing at the Lawrence Felting Co.'s mill. He has accepted a position as superintendent of a plant in Canada.

James Mulligan, boss weaver at the Faulkner Woolen Mill, Stafford Springs, Conn., has resigned to enter the employ of the Standard Company of Providence, R. I. Before leaving he was presented with a gold watch and chain.

William R. Dunn, who has been employed as designer at the Dunn Worsted Mills, for several years, has been promoted to position of assistant superintendent.

A. H. Gledhill has taken position as general manager of the Hesperus Mills, Hesperus, Can. He was for some months designer and superintendent of the Marston Worsted Mills.

Michael J. Shaughnessy will be manager and superintendent at the Holliston Mill, Holliston, Mass., and Emmet Shaughnessy assistant superintendent. The Holliston Mills have been sold out to A. W. Darling Co., of Valley Falls.

A son was born to Madame Paul Lamoitier at Moscow, Russia, on Aug. 2, 1903. M. Lamoitier is manager of the woolen mills of Mm. Michailoff et fils at Moscow, and well known to our readers through his articles in the magazine.

**Deaths.**

Sylvester C. Sherman, for the past 31 years overseer of the carding room at the Dexter Yarn Company, died recently. He was a well known resident of Pawtucket, having resided there since 1866.

Hugh A. O'Neill died recently at his residence in Philadelphia, Pa. He was born in Wisconsin, but had resided in the East for the last quarter of a century. He was formerly a manufacturer of woolen goods in Clifton Heights, Pa.

Mr. E. R. Dennis died recently at his home in Carrollton, Ga. Mr. Dennis was superintendent of the Mandeville Mills for two years and was held in high esteem by all who knew him. He is survived by a wife and several small children.

James Calvin Cooley, a retired commission merchant, died at his home in Westchester, August 15, aged 63 years. He was senior member of the firm Cooley, Turnbull & Co., until Jan. 1, 1902, when he retired on account of ill health. He leaves a widow, three sons and three daughters. Mr. Cooley was a member of the Union Club, Westchester Country Club, Merchants' Club and the Chamber of Commerce.

William W. Arnold, for many years an overseer in the Wamsutta Mills, but retired since 1892, died at his home, New Bedford, Aug. 24th. Mr. Arnold was born in Exeter, R. I., Jan. 6, 1822. He was quite prominent in Masonic circles. A widow and two daughters, one married, survive him.

W. A. Arney, overseer of carding at the Arlington Cotton Mills, Gastonia, N. C., died recently.

Robert Atherton, who since 1848 has been identified with the manufacture of textile machinery, died August 5th at his works in the old Franklin Mill, Paterson, N. J. Death was due to heart failure.

James Lowell Williams, Sr., a pioneer in the knit goods industry in central New York, died in Rome, N. Y., August 9, aged 72 years.

Walter W. Cumnock, well known manufacturer of Louisville, Ky., died recently at the Hotel Argyle, Winthrop Highlands, Mass. Mr. Cumnock was 37 years of age. A wife and three children survive him. He was superintendent of the Louisville Cotton Mills at time of his death.

George Luther Whitman died suddenly of appoplexy, at Manchester, Conn., where he had been visiting. Mr. Whitman was 69 years of age and was well known to the woolen trade of New York and Boston, as the head of Whitman, Phelps & Co. He leaves a widow and two daughters.

Nelson Whittier, treasurer of the Whittier Cotton Mills, died at his home, Aug. 14th, of paralysis of the heart. He was 67 years of age. A widow and one son, W. R. B. Whittier, agent of the company's mills in Alabama, survive him. Mr. Whittier was born in Methuen, Mass., and obtained his education in the public schools.

Mr. Joseph Sibson, sixty-three years old, died at his home, 6719 Germantown avenue, Germantown, Philadelphia, on Sunday, Aug. 30. Mr. Sibson was president of the Sibson & Stern Company, lace manufacturers. He had been identified with the lace and fancy knit goods manufacturing business all his life. As an inventor he had designed machinery that revolutionized the manufacturing of fine laces. For many years he carried on a factory for the building of machinery of his own invention. His best known invention is the Monitor pattern chain attachment for double rib knitting machinery. Mr. Sibson was a prominent member of the Knights of Pythias. A widow and two sons survive him.

Thomas J. Holton, the inventor and manufacturer, died at his home, 1717 North Seventh Street, Philadelphia, on Tuesday, August 18th. Mr. Holton was born in Philadelphia in 1843, and served as an apprentice with William Sellers & Co. After learning the trade of machinist, he engaged in the manufacturing business at Fourth Street and Girard Avenue. All the machinery manufactured by him was the product of his own invention. He invented the Champion sewing machine, the rib knitting, overedge and shell machines. His picture hangs in the Inventors' Gallery in Washington. He was President of the Perfect Smoke Consumers' Company, which was organized a year ago, when Mr. Holton invented a smoke consuming device. He was a Director of the Oakdale Building and Loan Association, and was also connected with several enterprises in the South.

Thomas Cunningham, president of the James Smith Woolen Machinery Co., died at his home in Philadelphia, on August 27. Mr. Cunningham was a descendent of Ralph Earle, a settler of colonial New England, and was born at Spencer, Mass., in 1818. He went to Philadelphia shortly after coming of age, and entered into partnership with James Smith, which was continued until the death of the latter. Besides being connected as president and stockholder in the James Smith Woolen Machinery Company, and James Smith & Co., Inc., Mr. Cunningham was also largely interested in the American Card Clothing Co., and was widely known in this connection. He was a prominent Mason and one of the orignial members of Oxford Presbyterian Church. His life has been an unusually active one and he attended personally to his extensive business interests until six months ago. In character he was strictly of the old school and his death causes a great loss to his wide circle of friends and business associates.

New Jersey, Plainfield. It is reported that Mr. Studley, formerly of Drosin & Studley, which firm has been dissolved, will re-open the mill, manufacturing knit goods.

## New Publications.

Commerce in Textile Fabrics; by Edmond Bourdain; J. Hetzel et Cie, 18 rue Jacob, Paris. Price, $1.00.

This work, published some years ago, is intended as a manual for those engaged in the buying and selling of textiles in France. It gives a brief description of the different fabrics, and a tabulated statement showing the commercial widths, principal manufacturing districts, and the distinctive characteristics of each. The various manufacturing towns are then taken up in turn and the particular line of goods, in which each excels is pointed out.

Transactions New England Cotton Manufacturers' Association, No. 74, Annual Meeting, April 22-23, 1903.

The papers read at the annual meeting of this Association last April make the transaction an especially interesting volume. The frontispiece is a portrait of the late Ambrose Eastman, an honorary member of the Association and its secretary and treasurer until 1894. The volume contains the charter and by-laws, list of officers and members, with the complete papers and discussion.

Chemistry of Dyestuffs; by Dr. Georg von Georgievics; translated from the Second German edition by Charles Salter; D. Van Nostrand, New York; Price, $4.50.

This is a book for the dyer's chemist and was originally designed to form a part of a text-book on the technology of textile fibres. It has, however, been published in a separate volume to make it more accessible to chemists interested in the chemistry of dyestuffs rather than in the dyeing and cloth printing industries. The author is professor of chemical technology at the Imperial and Royal State Technical School, Bielitz, Germany. The rapid progress made in the dyestuff industry has necessitated a thorough revision of many chapters that were the first to be written and the work thus includes all of the recent discoveries in this department of chemistry which have not been held as trade secrets.

The Raw Materials of the Vegetable Kingdom; Dr. Julius Wiesner, professor of the anatomy and physiology of plants at the University of Wien, Austria; second edition revised and enlarged; 2 vols.; price $8.00 per vol.; Wilhelm Engleman, Leipzig, Germany.

The last edition of this work which has been issued in serial form has recently been published and the work is now complete. The author began the introduction to his first instalment with the following quotation from Helmholtz: "The possession of knowledge should not be the sole object of man's existence. Knowledge should be put to practical use." The complete work indicates that the compilers have kept this thought constantly in mind. He places before the reader a vast store of information regarding the raw materials found in the vegetable kingdom which has been compiled by an able corps of editors selected from the most learned scientists of Germany. The text is in German and profusely illustrated.

Secrets of the Lightning Calculator; by Otto Neuhaus; A. Weller & Co., Papiermuehle bei Roda, Germany; price 50 cents.

A few of the methods of calculation given in this book might well be studied and used, but by far the greater number are of but limited application, and the difficulty in remembering them greatly outweighs the slight saving of time they may occasionally effect. The text is in German.

Steam Engines; Compiled by Herm. Haeder for school and workshop; 7th Edition Duisburg. Vol. I. Calculations and Details. 2,000 figures, 280 tables and numerous examples, 8 Vo. pp. XVI + 623. Cloth. Price, $3.12. Vol. II. Drawings and Illustrations. Large, 8vo. 112 + 118. Plates. Cloth. Price, $2.62. Vol. III. Valve Gearing, Part 1. Sm. 8vo. Pp. XVI + 368 + 40. Cloth. Part II. Problems and Drawings. Oblong, 8vo. 30 plates. Paper covers. Price, $2.25.

Haeder's Dampfmaschinen (Steam-engines) which first appeared about 1891, has since become a standard text-book in German schools and technical circles, passing through seven editions and now enlarged to three volumes, in which the intricate ramifications of the subject are separately dealt with. Though not so extensive as the monumental work of D. K. Clark, which forms the standard for English and American builders, it is more compact, and certainly contains all and far more than the average mechanical engineering student can be expected to pack into his head in a four years' course in connection with his other studies.

Notwithstanding the growing competition of other prime movers, and even of other steam motors, it is still true that the reciprocating engine is as indispensable a tool to modern industry, as the carpenter's saw and hammer, and without it we would be nowhere. The subject of steam-engine design has indeed become so vast and complex as to demand its relegation to specialists, and nowadays the manufacturer as well as the power-plant designer buys his steam-engines ready made in the same way as he would a type-writer for his office.

One cannot examine these volumes without realizing this; without realizing, in a word, in spite of the number of considerations brought before us—from thermodynamics down to the fillets on frame castings—the constant pressure for condensation, and the brevity of the space accorded to each.

Volume I deals with the subject in 16 sections, of which, however, section 10 alone (Construction Details) occupies more than half the volume; and besides the steam-engine proper, various accessory appliances are considered, while a few scattered leaves are given to gas-engines, rotary-engines, turbines and the Diesel motor—which by their very brevity seem out of place. We regret that some space could not be given to indicator-practice, and more to the different existing types of steam engine; but the book is almost exclusively confined to stationary engines. Steam pumps are relegated to a separate treatise, and boilers to another, by the same author.

To Volume III is reserved the special consideration of valve-gears; but the most striking feature is the division of the work, more than half the entire space being devoted to the pop-valve gear, which in this country is of little or no importance; while

the Corliss gear, which has fairly revolutionized the art, receives scant consideration. The slide-valve, too, which has still, in its numerous patented modifications, possession of the field in this country, is relegated to second place, while other types are not considered at all.

To the specialist, especially to one who would be informed of German engineering practice, the book cannot fail to be useful and valuable.

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Construction and Calculation for Practice and Schools; by Herm. Haeder. 2d Revised Edition. 1,400 cuts, 24 plates and supplement. 8 vo.; 493 pages. Duisburg, 1903. Price, $3.00.

This is what may be termed an attempt—and a fairly successful one—to combine an engineer's pocket-book and a general text-book for beginners and students in engineering. It is directed almost exclusively to machine design and matters connected directly therewith. It is divided into five parts, the first of which contains some 300 examples of varying complexity; the second relates to mechanical drawing; the third, to the construction of various machine details; the fourth is a reference compendium of formulas; and the fifth an appendix of mathematical and other tables. For American engineers familiar with German it will unquestionably prove useful not only in the ordinary way, but also as giving therein "pointers" on German practice. A regrettable defect is the very numerous errors of varying importance, by no means all of which are included in the long list of errata.

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Dyeing Khaki on Cotton (Khaki auf Baumwolle), by Dr. Friedrich Carl Theis; M. Krayn, Berlin, W., Germany; 64 dyed samples; Price, $3.00.

This is a very thorough and practical treatise on the dyeing of khaki shades on cotton goods. It is illustrated with 64 samples of cotton cloth showing different shades of khaki, for which complete dyeing directions are given. Abstracts of the principal patented processes are included in the work. It will be found invaluable to all having occasion to dye khaki shades on cotton. The text is mostly in German. Many of the English patent specifications are in English.

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Cartel and Trust (Kartel und Trust); by Dr. S. Tschierschky; Vandenhoeck and Ruprecht, Goettingen, Germany; Price, $1.00.

A carefully written pamphlet on the cartel and trust, their organization, objects and effects on society.

## Business Literature.

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Lowell Textile School, Lowell, Mass.; Bulletin.

The latest bulletin issued by this school gives the usual information concerning officers, instructors and faculty, school calendar and courses of instruction. A comparison with former bulletins shows the steady progress made toward the object of the management, to make this the most thorough and complete textile school in existence.

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Dixon's Index for Pencil Users; Joseph Dixon Crucible Company, Jersey City, N. J.

This is an interesting 35 page pamphlet containing a great deal of useful information regarding pencils for different uses. The index includes every occupation in which lead pencils are used and should be in the hands of all who have occasion to use them.

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Southern Railway Textile Directory, 1903; Southern Railway and Mobile and Ohio Railroad, Washington, D. C.

This pamphlet contains a list of the textile mills located on the lines of the two roads above named, giving the number of looms, spindles, kind of power and kind of goods manufactured.

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Reynolds Corliss Engines; Allis-Chalmers Company, Chicago, Ill.

A catalogue illustrating and describing various types of engines designed and constructed under the supervision of Edwin Reynolds, by the Allis-Chalmers Company.

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Industrial Plants; Ballinger & Perrott, Architects and Engineers, Philadelphia, Pa.

The August issue of this publication contains the usual amount of valuable information concerning mill construction and is illustrated with views of the new works of the Vulcanite Portland Cement Co., which were planned by Messrs. Ballinger & Perrott, and constructed under their supervision.

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Rubber Mats, Matting and Treads; Boston Belting Co., Boston, Mass.

An illustrated catalogue and price list of the extensive line of rubber mats, matting and treads manufactured by this well known company.

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A Ruberoid Album; The Standard Paint Co., 100 William St., New York.

A pamphlet containing testimonials from users of Ruberoid roofing throughout the country. Photographs of some of the various styles of buildings on which this roofing has been used are also shown and demonstrate its prestige and adaptability to varying requirements. The attractive cover of the pamphlet is made in imitation of the appearance of the roofing.

## Mate Cling-Surface with Oil.

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Several large New England mills have been exhaustively experimenting for better lubrication to reduce their friction load and thereby reduce the cost of operation. They have obtained reduction of from 12 to 20 per cent., which is a large item. But this has been with all the belts tight, as under the usual mill practice. In other words they have had to overcome friction in bearings running under not only working tension but under the additional tension from tight belts—a double friction.

What then would this percentage of saving be if Cling-Surface were used with the oil, preventing all slipping of these belts, rendering it unnecessary to run them tight?

The manufacturers of Cling-Surface are confident that the friction load of a mill is near to 50 or 60 per cent. at times and tight belts are responsible for almost half of this. They say: Cut out tight belts with Cling-Surface. Cut out working friction with proper oils. Cling-Surface is the mate to oil.

## Another Step Forward.

In no other item of textile mill supplies is the percentage of waste so great as in that of lubricating oils. We think mill agents will agree that at a conservative estimate for every drop of oil that is worn out in reducing friction between the surfaces of the average bearing, at least three other drops either never reach the bearing in the first place, or if they do reach it leak out of it at once, and besmear the belts, the goods in process and the floors.

This wholesale waste of oil has come to be regarded as a necessary evil by most mill men, although they know that if the same proportion of loss existed in every item on their supply sheet, their mills would not pay a dividend. They abate the nuisance as much as possible by installing numerous drip-pans (although when these occasionally run over or are knocked upside down by an unshipped belt, the remedy proves worse than the disease) and frequent wiping down with waste and let it go at that. There is certainly a fortune ahead of the man who can evolve an oil which will feed as positively as the present fluid oils, and yet will not drip off the bearings.

Of interest in this connection is the process of making lubricating oils non-fluid which was originated and is controlled by the New York & New Jersey Lubricant Co., 14-16 Church Street, New York City. They claim for their non-fluid oils that same remain on the bearings until entirely consumed, thus eliminating the drip and waste incident to the use of fluid oils and lessening the time spent in oiling up, besides largely reducing the cost of lubrication.

These products are adapted to nearly all classes of bearings in textile mills. The makers offer to send a testing sample gratis, by prepaid express, to any textile manufacturer upon application. This proposition seems worth investigating.

## Free Book on Boiler Compounds.

The importance of a boiler compound which will do the work of preventing scale formation in the boiler and yet will not work to the injury of dyes, is fully appreciated by textile mill superintendents. The International Boiler Compound Co., of 48 Market St., Chicago, claims to have prepared a material particularly adapted to use by textile mills. Their compound, they say, is very mild, so much so that it can be used for washing purposes without injury to the flesh or clothing. It is claimed that it makes the water as soft and harmless as the purest rain water. The company is sending out free of charge a booklet prepared by Dr. A. M. Kinkaid setting forth the uses of boiler compound. This booklet will be sent free on application. Address International Boiler Compound Co., 48 Market St., Chicago.

A statement, signed by H. M. Davitt, assayer, is to the effect that from 25 per cent. to 75 per cent. is saved in the running expenses and life of the boiler by using International boiler compound.

## The Asala Automatic Loom.

The Asala Company, 1 Greene St., New York, builders of the automatic shuttle and loom attachment which has already been described in these columns, are at present busily engaged in filling numerous orders for their new automatic shuttle and loom attachment. They have delivered a number of silk looms equipped with the device, and all who have seen these looms in operation are greatly impressed by the wonderful simplicity of the attachment and its highly satisfactory results.

The first new cotton looms to be equipped with this attachment will be ready in a few weeks, and as an automatic device of this character is of enormous importance to the cotton industry, the builders are confident that a flood of new orders will follow. Without taking into consideration these new orders the Asala Company is compelled to look for larger quarters in order to meet the daily growing demand for this loom attachment.

## Saratoga a Scene of Gayety.

Saratoga, the dashing resort, the sporting spa, the health giving haunt, where wearied minds and worn out frames find health and delight in the pure atmosphere and the gushing springs, is now at its season's height. Racing has commenced and for twenty days a grand scene typical of American sporting life can be witnessed at the famous spa. The thoroughbred horses, fine limbed and perfectly shaped, the speediest in the world; the midget jockies who have gained fame in France and England; the millionaire who deserts his Wall street office for the exciting race track, the fashionably dressed ladies of Chicago, New York and Boston society, they are all here, and they depict a scene which is strange to everyone but the summer Saratogian.

Note the excitement and enthusiasm at the track, the noise and bustle in the betting ring, he cheers when a favorite wins, the tense silence and the following thunderous roar and shout when a straggler, following the bunch, plods grimly on; ere the half is reached he is gaining, forward he advances, gaining, still onward through the field, on the outside at the turn, second in the stretch, and in a whipping finish is victor by a head. This is an every day scene at Saratoga Springs.

In the evening there is a continual promenade on the beautiful and spacious Broadway, Saratoga's Pennsylvania avenue, hundreds walking up and down, the hotel verandas crowded, their magnificent court yards scenes of festive gayety, the dazzling fountains cooling the breezes for the laughing throng, the strains of sweet music wafted from the hotel orchestra would please old Orpheus himself.

In the morning the proper thing is first a visit to the famous springs, a run across to Congress Spring Park, but see, you are not the first to quaff this purer than nectar, it really seems as though the throng of ladies and gentlemen had come with the first rays of the approaching dawn, for it is yet but 6.30 and hundreds are sitting at the tables drinking this sparkling water.

After breakfast a ride on the cars to the beautiful Saratoga Lake, while away an hour in the rustic theatre or in a sail over the smooth waters, then

continue on your trolley trip and ramble through the nearby historic towns of Schuylerville, Gates, Burgoyne, Stillwater, etc.

This is one day at Saratoga, the most brilliant, the grandest, the sparkling resort of America.

The Boston & Maine Railroad runs through cars Boston to Saratoga, and tickets during the summer months, Boston to Saratoga, can be purchased at a round trip rate of $8.00.

## Will Build Autos.

TERWILLIGER & CO., TO DEVOTE THEMSELVES TO THIS BRANCH OF WORK.

W. H. Terwilliger & Co., manufacturers of knitting machinery, who for some years have been conducting a flourishing business in their plant in Warner's Lane, Amsterdam, N. Y., have decided to abandon all branches of that business and devote themselves exclusively to the manufacture of automobiles. The management of the concern is not yet ready to give any more detailed statements as to the future plans than the above, except to add that they are now engaged in the construction of two heavy road machines, and that they have perfected several improvements and patents, which, they calculate will make their output at least the equal of any auto now on the road.

## Lake Winnipesaukee a Beautiful Spot in New Hampshire.

Renowned as a summer resort, and famous for its fishing, Lake Winnipesaukee seems to hold sway as the most popular section of New Hampshire. Indeed it would be approaching the impossible to select another spot where such ideal features enter into the making up.

Environments not beautiful but simple magnificent: in the distance the White Mountains with their Titan King, Mt. Washington looks down with the neighboring Mt. Madison close by its side. And enjoyment, there is something to amuse one all the time, first a coaching party through the neighboring towns, then a hop at this or that hotel, a paddle in the canoe, a fishing expedition in the direction of Annisquam, or that famous trip the sixty mile sail over the lake on the Steamer Mr. Washington.

Do you seek a delightful haven on the lake? Well, only choose, for you have Weirs, Wolfeboro, Alton, Alton Bay, Centre Harbor and Bear Island and the other beautiful islands; all these resorts reached in a short while by drive or sail.

Lake Winnipesaukee is only two hours' ride from Boston on the Boston & Maine Railroad, and the round trip rate for the summer is $4.50 to Weirs or Wolfeboro and $4.00 to Alton Bay. Board at hotels or farm houses from $5.00 up.

## Latch Needles.

The business of Freeman Bros., located at Brattleboro, Vermont, is continuously on the increase. This firm are manufacturers of a most excellent line of latch needles and the best evidence of the superior quality of their needles is due to the fact that they not only obtain new customers continuously, but that new customers soon become permanent ones, as rapid orders for their goods is one of the claims which they make and which they are proud of. Their list of customers includes a great many of the representative needle mills of this country.

M. J. Whittall, Worcester, Mass., is building a central power station to take the place of several small plants now scattered and attached to his various mills. Power will be transmitted electrically, and all modern appliances to produce the highest economy will be installed which were not possible to be used under previous conditions. Among the more noticeable features included in the new equipment is a large Green Economizer in the boiler house.

## L. T. Ives & Co.

The needle manufacturing plant of Loyal T. Ives, New Brunswick, N. J., has been sold by him to Edward Bromley, John W. Hepworth and Howard A. Sillcocks, of Philadelphia, who will form a close corporation and operate under the name of the L. T. Ives Co. Mr. Sillcocks has been superintendent of the factory for several years. Mr. Ives retires on account of age. The new owners have taken charge.

## Allis-Chalmers Co.

Among the July sales made by the Allis-Chalmers Co., Chicago, Ill., we note the following, Corliss engines: Chicago Beach Hotel, Chicago; Knox Construction Co., Chicago; Richmond Cedar Works, Richmond, Va.; Barrett Mfg. Co., Beloit, Wis.; American Aristotype Co., Jamestown, N. Y.; Stilwell-Bierce & Smith-Vaile Co., Dayton, Ohio; Consumers' Heat & Electrictco, Bloomington, Ill.; Union Sugar Co., San Francisco, Cal.; Canton Oil Mills Co., Canton, Miss.; Mr. Henry Du Ponr, Wilmington, Del.; Olds Motor Works, Lansing, Mich.; The Clayton Oil Mills, Clayton, N. C.; C. A. Macdonald, Chicago; Arkansas City Milling Co., Manhattan Rubber Mfg. Co., Passaic, N. J.; Charles B. Pride, Appleton, Wis.; Columbus Buckeye Lake & Newark Traction Co., Columbus, O.; Lock, Moore & Co., Ltd., Westlake, La.; Georgia Cordage Mills, Decatur, Ga.; Marquette Cement Mfg. Co., La Salle, Ill.; The Gauley Co., Demdenon-Gauley, W. Va.; Rock Hill Water, Light & Power Co., Scranton, Pa.; Fourche River Lumber Co., Chicago. Corliss engine, and two air pumps, two jet condensers, Coe Brass Mfg. Co., Torrington, Conn. One air pump and jet condenser, J. I. Case Plow Works, Racine, Wis. One combined hor.-vert. expansion engine, three Sederholm boilers. The Homestake Mining Co., Lead, So. Dak. One blowing engine, Lacey-Buek Iron Co., Birmingham, Ala. One Corliss engine, two tubular boilers, one water heater, Charles Waite, So. Dak.

### The Clapp and Fowler Waste Co.

In the August number a notice was made of the dissolution of the Clapp & Fowler Waste Company. We wish to inform the trade that the Clapp & Fowler Waste Company is a corporation and has not altered its business in any respect since it commenced operations with the exception of the recent change in its officials; Mr. Fowler taking the office of Mr. Clapp, resigned; and Mr. Weaver the old director, office formerly held by Mr. Fowler. The stock of the company is now controlled by Mr. Fowler, who purchased the stock held by retiring officers. The title name has not changed in any respect and the offices and warehouse are at the old address, 414-416 South Front Street, Phila.

### Selling Direct.

The Fort Plain Knitting Co., of Fort Plain, N. Y., are now selling their goods direct. Their New York office is in the New York Life Building room 939, and D. H. Standish, Vice President of the company is in charge. They have recently added a Davis & Furber napper and eight knitting frames to their equipment at the mill, and report a very satisfactory season.

### No Place Like It.

There are seashore resorts everywhere, but few sections can compare with the famous New Jersey Coast and there is nothing more beautiful. The bathing is the finest, the climate delightful and the surroundings enchanting. There are fine roads in every direction and the traveler is in the midst of a region in every way to his liking. Likewise the interior of Jersey is interesting from every standpoint. The General Passenger Department of the New Jersey Central has just issued a profusely illustrated book on New Jersey entitled "Sea-shore and Mountains," which is sent to any address upon receipt of 6 cents in stamps by C. M. Burt, General Passenger Agent, New Jersey Central, 143 Liberty Street, New York.

### Mercerized Yarn.

The business of the Blissville Mills located at Norwich, Conn., is continually on the increase, and is due to the high character of the yarns that they produce there. Their mercerized cotton yarn has won for itself a very enviable reputation among the trade, and we bespeak for this company a great future. Mr. Rufus W. Tilder is President, and Mr. Edwin Oldfield, Treasurer, of the corporation. Any concern interested in this particular line would do well by writing to this company for prices and samples.

### The Barney Ventilating Fan.

Mr. J. E. Barney, inventor of the famous Barney Compound Ventilating Wheel has returned to the company which bears his name and manufactures his wheel and will give his attention to its installment in mills, etc., where exhaust ventilation is required.

### Homer F. Livermore.

The business of Homer F. Livermore, 85-87 Pearl St., Boston, Mass., is continuously on the increase and he is building up a very enviable trade among the textile mills of the country with his loom repair parts, castings, and mill supplies. One of his principal specialties on which he is doing a flourishing business, is that of his improved canal rack rakes, and the customers for that article are among the representative mills throughout the country. This rake is especially adapted for clearing out canal racks, and is constructed of malleable iron fitted to a hard-wood handle being ferruled and strongly pinned. By referring to a recent issue of the Textile World Record, an illustration of this device can be seen.

### Keystone Fast Black.

In this issue will be found the advertisement of the Keystone Fast Black Dye Works, 1929 to 1939 E. Westmoreland St., Philadelphia, of which Mr. John Boston is the proprietor. Mr. Boston, for many years, has been engaged in the dyeing of fast black on hosiery and is prepared to do work of this kind in the very best manner. For some time his establishment was located at 1840 E. Huntingdon Street, but the increase in his business compelled him to look for other quarters. He has now erected a building of brick, one story high, on Westmoreland Street, the dimensions of which are 120 by 80 feet, and which he has equipped with the latest modern apparatus for dyeing of fast black hosiery. The power house for this new establishment is apart from the main building and contains engines and boilers of the latest type. Mr. Boston states that in this new plant he will be able to do all the work that comes his way, and to that end he would be pleased to have manufacturers who are looking for a dyer to do this kind of work to give him a trial. It is also the intention of Mr. Boston to take up the matter of dyeing cotton yarns in the near future.

### William Firth.

The numerous friends of Mr. William Firth, president of the William Firth Company and of the American Moistening Company will no doubt be pleased to learn that he has leased the Col. Hopkins estate at Brookline, and is making arrangements to occupy same at an early date.

The Textile Machine Works, Thun & Janssen, Reading, Pa., are building a two-story brick building, 50 by 100, to be used as a pattern shop.

Ashton (R. I.) Mills are improving and enlarging their steam plant. Among the up-to-date features will be a Green economizer. The Lonsdale (R. I.) Bleachery are extending their plant and have bought a third Green economizer to keep pace with the growth of the plant.

Kentucky, Louisville. It is reported that the Slayden-Kirksey Woolen Mills, Waco, Texas, contemplate establishing a plant here.

## New York City Excursion.

Of all the beautiful trips which are yearly offered, the annual excursion via. the Boston & Maine Railroad to New York city is foremost.

This trip is via. the famous Hoosac Tunnel route through the Hoosac mountains along the Deerfield valley and the Berkshire hills, through a grand portion of eastern New York state to Albany, N. Y.

A royal welcome will be extended at Albany and special preparations have been made to entertain the visitors. From Albany, N. Y., the trip is via. the steamer down the Hudson river. No painter can portray, neither can any description do justice to the scene which meets one's gaze—a succession of interesting places, historical landmarks, scenic landscapes, mountains, valleys, caves and cliffs palisades and forts, all are passed, and then when one enters the sound, what a sight, strange and interesting meets the gaze! The view of New York harbor in the early morning is a scene impressive and interesting. Hundreds of craft, sailing yachts, row boats, tugs, fishing smacks and ocean liners are all playing their busy part. The beautiful steamer docks at Desbrosses Street pier, and sight seeing in the city of New York commences. Go where you please there are a hundred, yes, a thousand, points of interest in the metropolis.

Leaving New York the return trip to Boston is via. the Fall River Line steamers.

The rate is $5.00 for the round trip from Boston, Worcester and Providence. The train leaves Boston at 8:55 a. m., October 1st, arriving in Albany, N. Y., at 3:40 p. m. You can take the night boat for New York city, which leaves at 8:00 p. m., down the Hudson and arrive in New York at 6:00 a. m., October 2d, or you can stop one night in Albany, visit the interesting places in this city and take the day line boat to New York city, leaving Albany at 8:00 a. m., October 2d, arriving in New York at 6:00 p. m. that night. You can leave New York October 2d or 3d via. the Fall River Line for Boston, or if you desire to stop longer in New York, upon depositing your ticket with $2.00 at the dock office of the Fall River Line, the limit will be extended ten days.

Consider this trip for $5.00! A ride through the Hoosac mountains, the Berkshire hills and the prettiest portion of eastern New York state, a sail down the Hudson river, and an ocean trip back to Boston in a palatial steamer.

Round trip tickets will be on sale at 322 Washington street, Boston, and at Union Station ticket office.

Tickets will be on sale on and after September 23d.

## American Drying Machinery Company.

The demand for machinery built by the American Drying Machinery Co., Westmoreland and 19th Sts., Philadelphia, has been so great that they have been compelled to more than double their capacity, and have now under consideration a plan for the further increase of 100 per cent. Orders are coming in much faster than they can fill them and in view of this expansion of business the concern has been organized as a stock company. Following is a notice of the change:

Notice is hereby given that the copartnership heretofore existing between William Miller, Thomas B. Osmond, Bertrand A. Parkes, Thomas Miller, and Howard Morshead has been heretofore dissolved on the twentieth day of August, 1903, by mutual consent. All debts due by the copartnership will be paid by The American Drying Machinery Company, a corporation organized under the Laws of the State of Pennsylvania, and all debts due the old copartnership shall be paid to the said corporation, which will continue the business of the old copartnership.

William Miller,
Thomas B. Osmond,
Bertrand A. Parkes,
Thomas Miller,
Howard Morshead.

## Perforated Copper.

The A. J. Buckley Co., Garwood, N. J., intend to double the capacity of their plant in order to supply the demand for their product, which consists of every kind of perforated copper required for industrial purposes. They make a specialty of perforated copper for scouring or rinsing boxes, dyetubs, dusters, openers, pickers and other textile processes.

## A. M. Goodale & Co.

The business of A. M. Goodale & Co., 50 State St., Boston, Mass., brokers, cotton goods, print cloths, yarns, etc., is continuously on the increase. Mr. Goodale's many years of experience in cotton manufacturing and his large and valuable acquaintance among manufacturers and buyers have aided materially toward this result.

They have correspondents in New York, Fall River and Providence, and are selling the product, both yarn and cloth, of several mills in the South. Mercerized yarn is one of their specialties.

## Indexing Catalogues.

It has been well said that there are two kinds of knowledge, first the knowledge that one actually possesses himself and second, the knowledge where to get the information that one wants. In many respects the latter kind of knowledge is more valuable, because there is no man who can carry in his own head all the information that would be useful for him to use. A manufacturer of every kind is constantly having occasion to seek information outside of his own personal knowledge. Oftentimes the information is available, if he only knew where to get it.

In the matter of catalogues, frequently they are thrown away or into a corner and forgotten. When the time comes that they are wanted, they never can be found, even the name of the manufacturer is forgotten. In such cases, the inquirer very naturally turns to his trade paper, and we are very glad to answer any inquiries of this nature that comes to this office.

Different societies of manufacturers have discussed the advisability of adopting certain standard sizes of catalogues, but so far as we know, little or nothing has been done toward that object. Until such a standard has been established, a system of card indexing greatly facilitates reference, and a few manufacturers have adopted the system of furnishing customers and the trade generally with standard index cards, 3 by 5 inches, on which are printed the specifications of the different machines and devices which they manufacture and on which they issue catalogues.

The Albany Steam Trap Co. of Albany, N. Y., has what seems to us a model system of this kind, and we are again reminded of the desirability of the general adoption of such a plan on receiving from them a number of such cards. In our own office we adopt a somewhat similar plan of indexing catalogues, which enables us to refer quickly to the many different lines of textile machinery and appliances.

## Factory Sites.

Specialization is a marked feature of the development in business methods during recent years. Another evidence of this is found in The Manufacturers' Exchange, 277 Broadway, New York, which acts as an intermediary for manufacturers desiring to secure locations for their plants. The difficulties in the way of the individual seeking such locations are obvious, undesirable publicity, fruitless investigations of undesirable sites, expense and loss of valuable time. The Manufacturers' Exchange makes a specialty of this work. It has an efficient organization, detailed and carefully classified information regarding a large number of locations, and long experience in conducting negotiations. A book giving information as to their work can be obtained on application to the general manager, G. M. Vescelius, 277 Broadway, New York.

## Purification of Water.

Wm. B. Scaife & Sons Co., of Pittsburg, Pa., sole manufacturers of Scaife and We-fu-go water softening and purifying systems, will be represented in the future in Philadelphia by Duncan W. Patterson, M. E., with offices in the Harrison Building, corner 15th and Market Sts., in place of Mr. Fierstine, whose offices were in the Bourse Building.

Mr. Patterson has been handling the "Bachman" system of water purification, a continuous system, treating hot feed water under pressure, for the past two years, and has made a number of installations at some of the large iron works and furnaces, and is thoroughly familiar with water purification in all its branches. He will have charge of all the work of Wm. B. Scaife & Sons Co., in Eastern Pennsylvania, Southern New Jersey, Delaware, Maryland and Virginia in their water purifying department.

## The First Trade Unions.

In a foreign work entitled "Conflicts between Capital and Labor," published some years ago in Europe, the following account is given of the labor organizations of early times:

"The weavers were the first to institute the craft guild; they formed a kind of middle class between the patricians and the bond craftsmen; they were distinguished above all others by their wealth, self-respect and love of freedom. While the other crafts worked merely to supply local wants, the weavers found markets for their wares in the most distant countries. This naturally invested them with greater importance and hence their unions enjoyed the greatest independence. In all towns they stood at the head of the craftsmen and in all the contests of the handicraft class with the patricians and merchants for political freedom and power, the struggles and victories were those of the weavers.

"In all the chief manufacturing towns at that time the most ancient guilds were those of the weavers; they existed in England, Flanders Brabant and the Rhenish provinces. The guilds of the London weavers and also of the Oxford weavers, were chartered by Henry I, and in the reign of Henry II the weavers' guilds that existed in Nottingham, York, Huntingdon, Lincoln and Winchester were confirmed by the king. Thus early in the twelfth century the craft guilds of the weavers were firmly established and chartered by the Crown.

"On the continent they were scarcely less powerful; there was a wool weavers' guild at Cologne as early as the eleventh century, the oldest German charter being that of the Cologne weavers' guild. In 1149 the pillow-case weavers formed a fraternity with the consent of the judges, sheriffs and aldermen, and thenceforth all who wished to carry on trade in the town were forced to join and submit to its rules. The record proves that this union of handicraftsmen had existed prior to 1149 and that it was merely confirmed in that year. At Spire a guild of wool weavers existed at the beginning of the twelfth century; there is mention of one at Mayence in 1099 and at Worms in 1114, while at Frankfort-on-the-Main the wool weavers ranked first among the crafts.

"In Flanders and Brabant, which occupied the first rank in the manufacture of woolen goods, the wool weavers' guild was still more influential and prominent and appears as almost the sole leader in all the movements and revolutions of the handicraft class. Even the serfs seem to have confederated into guilds. So deeply did the old idea of guild brotherhood permeate the inhabitants of these independent provinces that it has been supposed that these first craft guilds originated with the industrious and stubborn weavers of these provinces."

## Enlarging Their Plant.

We understand that Bosson & Lane, Atlantic, Mass., have taken advantage of the lull in business and installed an additional large tank to their anti-chlorine plant, giving them twenty-five per cent. greater capacity than formerly. They are also fitting up a new press in their castor oil department.

Massachusetts, Newton. The Saxony Worsted Mills have started operations on full time.

# Recent Textile Patents.

Astrakhan, Imitation. 736,412. Martin Lewin, Berlin, Germany, assignor to Edward Mix, New York, N. Y.

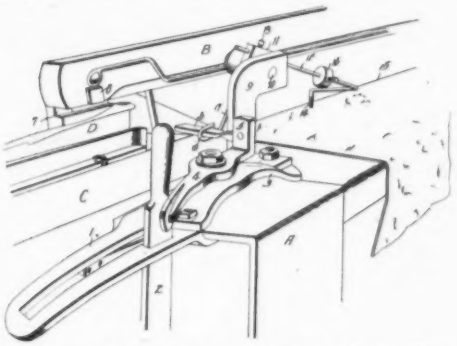
Bobbin Holder. 736,617. Thomas J. Murdock, Franklin, Mass., assignor to Murdock & Geb Co., Franklin, Mass.

Card Punching Machine. Jacquard. 734,729. Max Mertens, Elberfeld, Germany, assignor to the firm of Mertens & Frowein, Elberfeld, Germany.

Cloth Cutting Machine. 735,848. Edward M. Waring, Brooklyn, N. Y.

Cloth Thin Place Detector and Preventer. 735,050. Bingham F. S. Austin, Gastonia, N. C.

The object of this invention is to provide a loom with an attachment which will detect thin places in the cloth and will automatically stop the loom as soon as such thin place is at a distance of four or five picks from the fell of the cloth, so that the defects may be remedied by beating up without the necessity of picking out any of the weft-threads.

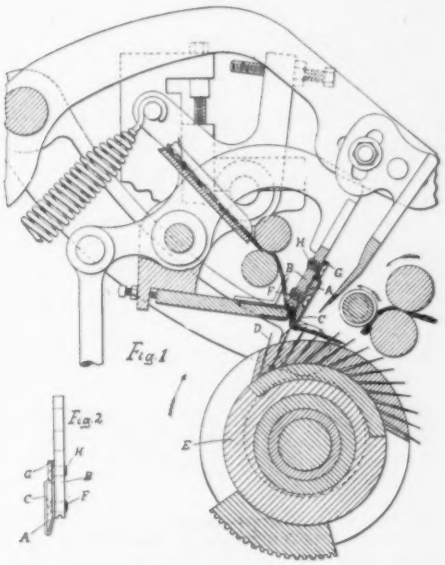


A further object of the invention is to provide a mechanism of this character which will be entirely automatic in its operation, and which may be adjusted in accordance with the thickness of the fabric so that it may be employed in connection with any class of goods.

Combing Machine. 734,652. Charles F. Ainsworth, Horwich, and Sylvanus Anderton, Bolton, England.

This invention relates to combing-machines for the treatment of fibrous substances of the class usually styled the "Heilman" type, wherein a rotary cylinder carrying combing-needles is mounted to operate in contiguity and conjunction with nipping-jaws which retain or hold the fibrous substances while being acted upon by said needles, said jaws being usually styled the "nipper-knife" and "cushion-plate."

In the adjustment or setting of the nipper-knife as heretofore constructed, it has been found necessary to allow sufficient space between the edge of its lip and the path of motion of the needles' points to enable these latter to travel clear of the same without actually being brought into contact with it under any circumstances; otherwise said




points would be damaged and rendered unfit for service. To obviate this and provide means whereby the nipper-knife may be adjusted or set considerably closer to the path of motion of the needles' points without endangering their efficiency, thus enabling said needles to operate upon a greater quantity or thickness of material, is the object of the present invention.

Cotton Gin. 735,455. James Brandon, New York.

Cotton Gin. 736,227. Ardeshir M. Dastur, Jalna, India.

Cotton Press. 734,695. James T. Fuller, Calvert, Texas, assignor to Julius F. Workum, Englewood, N. J.

Cotton Press. 735,368. Elmer E. Hanna, Chicago, Ill.

Embroidering Machine. 735,599. Friederick Mueller, Newark, N. J., assignor to The Singer Mfg. Co.

Fibre from Leaves. Machine for Extracting. 734,936. Alberto Parres, Mexico, Mexico.

Fibrous Material. Pneumatic Apparatus for Producing Mats or Bats of. 735,217. Julius DeLong, Brooklyn, N. Y.

Fibrous Material. Producing Mats or Bats of, 735,218. Julius DeLong, Brooklyn, N. Y.

Ginning Apparatus. 734,696. James T. Fuller, Calvert, Texas, assignor to Fuller Cotton Gin Company.

Loom or Frame for Bead Work. 736,701. Theodore F. Damm, Milwaukee, Wis.

Loom. Kindergarten. 735,177. Lizzie A. Truesdale, Milwaukee, Wis.

Loom. Machine for Soldering Healds for Weaving. 736,593. Jean Gohy, Ensival, Belgium.

LOOM FOR MAKING Laces. 733,426. August Ronsdorf. Amsterdam, Netherlands, assignor to Jan Herman Van Eeghen and Isaak Da Costa, Amsterdam, Netherlands.

LOOMS. Means for Preventing Warp Breakage in. 731,622. Charles F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Narrow Ware. 734,390. Frederick E. Zenzerl, Philadelphia, Pa.

LOOM NEEDLE Motion. 733,586. George F. Hutchins, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM NEEDLE Motions. Stop Mechanism for. 733,207. George F. Hutchins, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM PICKER Stick Mechanism. 733,655. William H. Kelley, Reading, Pa., assignor of one-third to Samuel F. Keller, Stonycreek Mills, Pa.

LOOM. Pile Carpet Weaving. 732,216. Heinrich Panitschek and Johann Ahorn, Sarajevo, Austria.

LOOM SHEDDING Mechanism. 732,992. George B. Ambler, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE. 734,189. Peter Moresi, Paterson, N. J., assignor to Dexter Lambert & Co., Paterson, N. J.

LOOM SHUTTLE Box Operating Mechanism. 731,532. Alexander Barbier, Lyons, France.

LOOM SHUTTLE Checking Mechanism. 732,437. George H. Parker, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE Cop Carrier or Spindle. 733,386. Major Goodwin, Jr., Wareham, Mass.

LOOM SHUTTLE Weft Detecting. 733,601. Robert Slack, Rochdale. England.

LOOM TAKE-UP Motion. 732,436. Oscar L. Owen, Whitinsville, Mass., assignor to Whitin Machine Works, Whitinsville, Mass.

LOOM THREAD Parting Mechanism. 732,460. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 732,885. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 733,077. Henry A. Owen, Whitinsville, Mass., assignor to the Whitin Machine Works, Whitinsville, Mass.

LOOM WARP Stop Motion. 733,079. Albert K. Pratt, Whitinsville, Mass.

LOOM FOR WEAVING Tufted Fabrics. 732,518. John A. Clark, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

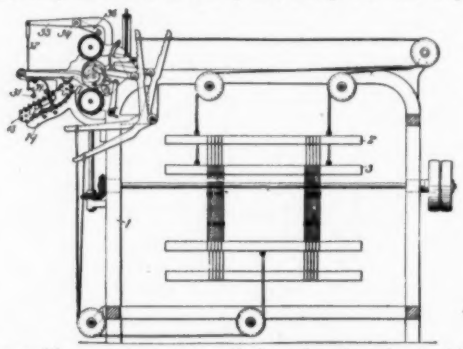
LOOM WEFT Replenishing Mechanism. 734,007. Earl A. Thissell, Lowell, Mass.

LOOM WEFT Replenishing Mechanism. 733,884. Earl A. Thissell, Lowell, Mass.

LOOM WIRING Motion. 731,903. Edward Hollingworth, Dobcross, England, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Loom Pattern Chain. 735,037. William J. Lutton, Paterson, N. J.

This invention relates to an improvement in looms, and has more particularly for its object



provide a new pattern-chain whereby the heddles may be operated to produce a great variety of weaves with a pattern-chain of very few bars, thus materially reducing the cost of the pattern-chain and also the weight thereof.

A still further object is to provide a new pattern-chain in which rocking bars are provided with mutilated spools, so that when the bars are turned in one direction the spools may be used to operate the heddles and when turned in the other direction will fail to operate the heddles.

Loom Pattern Chain. Joseph T. Cyr, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM LET-OFF MECHANISM. 728,961. James J. Muldowney and Henry Tomlinson, Lawrence, Mass., assignors to Draper Co., Hopedale, Mass.

LOOM FOR THE MANUFACTURE OF COIR MATS. 730,339. Owen Bullock, Hemel Hempstead, England and William H. Forty, Boxmoor, England, assignors to Bullock, Forty & Co., Hemel Hempstead, England.

LOOM PATTERN MECHANISM. 729,880. William J. Lutton, Paterson, N. J.

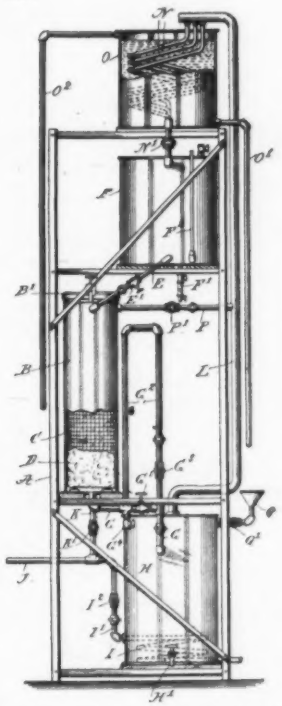
LOOM PICKER. 730,476. David G. Rogers, Paterson, N. J.

LOOM PICKER CHECKING MEANS. 729,048. Arthur Eaves, Fall River, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PICKER STICK CHECK. 731,120. Thomas E. Norman, Fall River, Mass., assignor of one-half to Joseph Kirkman, Fall River, Mass.

MEASURING AND MARKING Fabrics, Etc. Machine for. 731,702. August Monforts, Munchen-Gladbach, Germany.

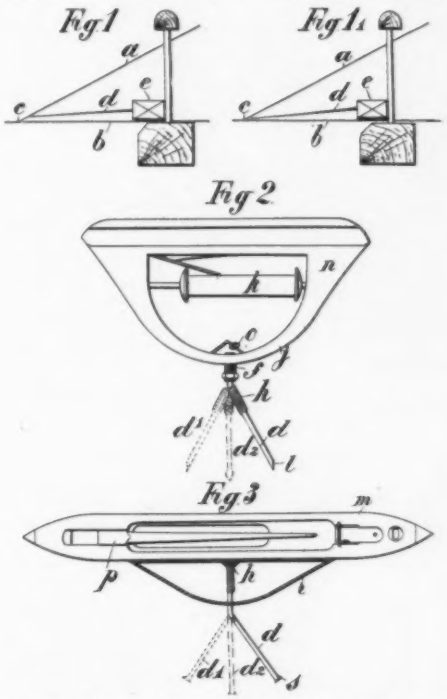
WOOL WASHING Apparatus. Raw. 729,333. Abraham Haas and Edgar Baruch, San Francisco, Cal.



This invention relates to apparatus for washing raw sheep's wool and similar fibres, and its object is to provide a new and improved raw-wool-washing apparatus which is simple and durable in construction, very effective in operation, easily manipulated, and arranged to permit its use in local wool-growing centres, to allow of washing or cleansing raw sheep's wool and other textile fibres without the use of elaborate plants or machinery, and to remove the ratural greases, fats, dirt, and other extraneous matter from the fibres, and to convert the by-products into merchantable materials.

WOVEN FABRICS. Apparatus for Preventing Production of Reed Stripes in. 728,366. Nicolas Chaize and Jacques Chaize, St. Etienne, France.

Up to the present time reducing reeds of greater or smaller size and often of great strength have been employed for the purpose of better dividing the warp in looms and to cover as well as possible the races or reed stripes caused by the dents in well-regulated woven fabrics. These well-clamped reeds attain their object in part and have the great disadvantage that they strip the warp threads and provoke many breakages. If the reeds be less tightly clamped, it is necessary to increase the number of




threads without thus effacing the reeds or reed stripes produced by the dents of the reeds.

The object of this invention is to avoid all these inconveniences by an absolute and automatic filling of the warp threads at each opening of the warp for the passage of the weft, and to obtain with a reduced number of warp threads a fabric or a ribbon having an appearance similar to one manufactured with the normal number of threads. It is thus possible to reduce the weight or size of the textile material if the number of warp threads be not too greatly reduced.

LOOM SHUTTLE. 729,615. Joseph E. Lemyre, Manchester, N. H., assignor to Textile Machinery Improvement Co.

This invention consists of an improvement in loom-shuttles, and has for its object the prevention and saving of waste.

The manner of use is as follows: The cop-seat, which consists of the shield E, and its spring-base F, is placed upon the butt d' of a cop, which by reason of the conical shape of the cop-support E

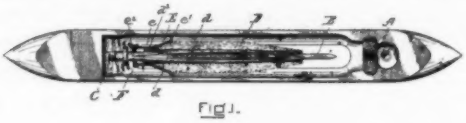


Fig.1.

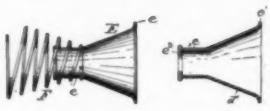


Fig.2. Fig.3.

fits the support quite snugly. Then the spring F, neck e, and cop D are slipped upon the spindle B and pressed down in the usual manner, the spring F coiling upon itself and pressing against the cop-butt d'. This spring-pressure is resisted by the spring of the spindle B, which is of the ordinary construction.

LOOM. LENO-WEAVING. 729,012. William Tallant, Waltham, Mass., assignor of one-half to Arthur H. Gulliver, Waltham, Mass.

In the ordinary so-called "leno-weave" one thread, during the formation of the "leno-shed" is crossed over the adjacent warp- thread, whereby the two said warp-threads appear crossed at intervals, this crossing of the warp-threads being commonly accomplished by means of a "doup" operated by a "doup-heddle."

It is the object of this invention to provide a

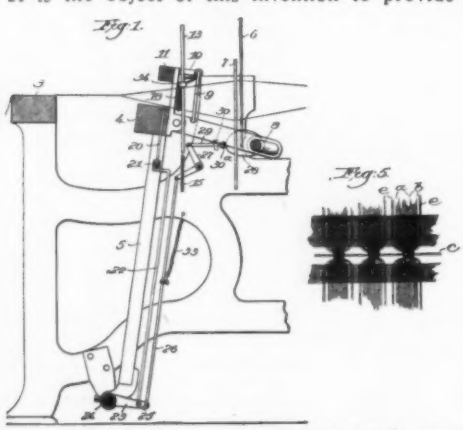


Fig.1.



Fig.5.

loom of this class wherein instead of single warp-threads being crossed during the "leno-pick," a set of warp-threads comprising a plurality of adjacent threads are crossed over or under a second set comprising a plurality of adjacent warp-threads, one of these sets being carried into one plane of the shed and the other into the other plane during the leno-pick. In the drawings, Figure 1 is a vertical section of a sufficient portion of a loom to show the invention. Fig. 5 shows the fabric made by a loom embodying the invention.

LOOM. LAPPET. 731,377. Charles A. Littlefield, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

Loom Reed. 736,670. Gustav de Zorawski, Ozorkow, Russia.

Loom Shedding Mechanism. 734,767. George W. Stafford, Warwick, R. I.

Loom Shedding Mechanism. 734,834. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

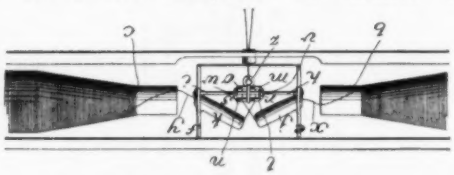
Loom Shuttle Automatic Threading Device. 736,500. Robert L. Cumnock, Anderson, N. C.

Loom Shuttle. 736,580. Joseph Coldwell and Christopher G. Gildard, Fall River, Mass.

Loom Shuttle. 734,189. Peter Moresi, Paterson, N. J., assignor to Dexter, Lambert & Co., Paterson, N. J.

This invention relates to a loom-shuttle, and more particularly to a loom-shuttle arranged to carry several quills for the purpose of feeding a weft of several threads as the weaving progresses.

Considerable annoyance has hitherto been



caused by the breaking of one of the threads while the weaving progressed to a greater or lesser extent with the other thread, thereby producing a defect in the fabric. This has happened because of the difficulty on the part of the operator to observe at a glance whether one or both of the threads were intact.

The object of the present invention is to provide a simple and effective means for causing a breakage of a companion thread when for any cause one of the threads of the group being fed is broken, thus calling prompt attention to the fact of the breakage and preventing the weaving of one of the threads independently of its companion thread.

Loom Shuttle. Weaver's. 736,079. Eduardo G. Ferreira, Rio Janeiro, Brazil.

Loom Warp Stop Motion. 735,184. Alfred Wenning and Jules Bicking, Mulhouse, Germany, assignors to Societe de Alsacienne de Constructions Mecaniques, Mulhouse, Germany.

Loom Warp Stop Motion. 735,785. Joseph E. Lemyre, Manchester, N. H., assignor to Textile Machinery Improvement Co.

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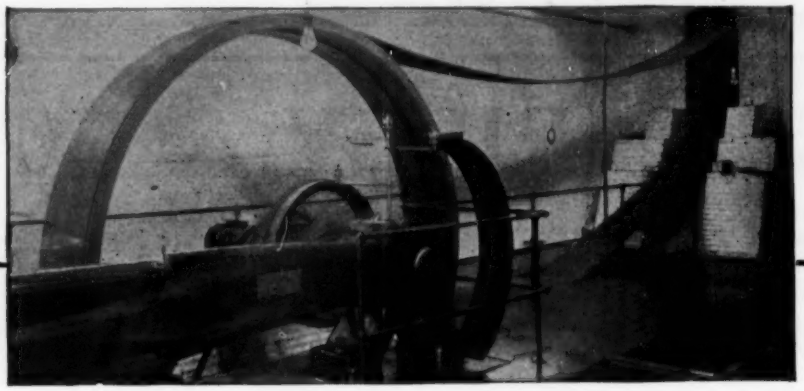

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Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

**Knit Goods Finishing Machines, Crochet, Etc.**
Arnold Sewing Machine Co.
Craw, J. W., Laundry Machinery Co.
Johnson Novelty & Mill Supply Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Sewing Machine Co.
Willcox & Gibbs Sewing Machine Co.

**Knitting Machine Cylinders.**
Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
Stafford & Holt.
Stanton & Lewis.

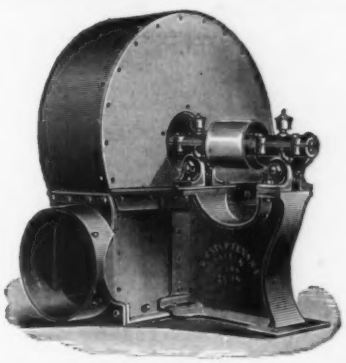
**Knitting Machinery.**
Adams, John.
Adams Rib and Top Cutting Mch. Co.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Champion Machine Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Hemphill Machine Co.
Hess, J. Calvin.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Ludwig, E. H.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.

**Alphabetical Advertising Index, with page numbers, follows this list.**

# Waste and Dust

**from Hoppers, Pickers, Shearers, &c., can be absolutely removed by the positive action of a**

# STURTEVANT EXHAUST FAN



**Maintains clean work rooms and avoids the annoyance and great expense of dust chimneys.**

## B. F. STURTEVANT CO.

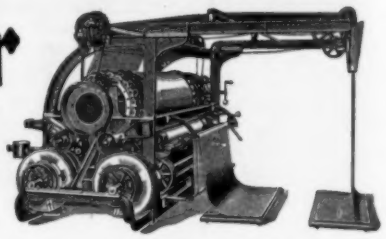
**BOSTON, MASS.**

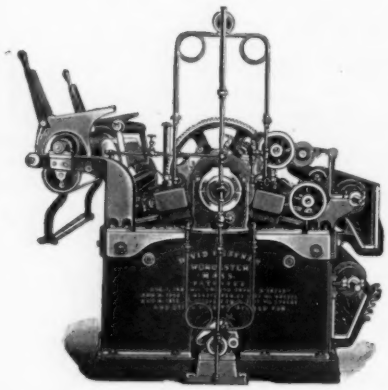
**New York Chicago Philadelphia London**

215

# David Gessner

## Worcester, Mass.

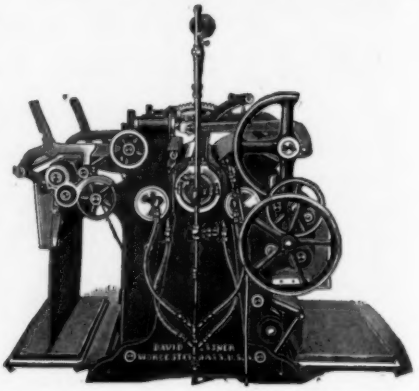




**Latest Improved Cloth Finishing Machinery**

—

**Napping Machines and Presses a Specialty**




Knitting Machinery—coni.
Pepper Machine Works.
Richter, Wolfgang.
Ruth Automatic Knitting Machine Co.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.
Wildt & Co.

**Knitting Needles and Supplies.**
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Freeman Bros.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Ruth Automatic Knitting Machine Co.
Treat, Orion.
Wardwell Needle Co.

**Labeling Machine.**
F. & G. Novelty Co.
Saranac Electrical Mfg. Co.

**Laboratory Outfits.**
Feidt, Geo. D. & Co.

**Leather.**
Houghton, E. F. & Co.

**Leather Boards.**
Rogers Paper Mfg. Co., Inc.

**Lockers.**
Narragansett Machine Co.

**Loom Forks.**
Clegg Weft Fork Co.
Non-Rebounding Loom Fork Co.

**Looms.**
Asaia Co.
Crompton & Knowles Loom Works.
Draper Company.
Fairmount Machine Works.
Howard Fndy. & Mch. Wks. (For Wire).
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stafford, George W. Co., The.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

**Loopers.**
Beattie's Machine Works.
Hepworth, John W. & Co.
Leighton Machine Co.

**Lubricators.**
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

**Lumber.**
Stearns, A. T., Lumber Co.

**Lumpers.**
Gerry, George & Son.

**Machinery Dealers.**
American Textile Supply Co.
Jefferson, Ed. & Bro.
Pittsburgh Gage & Supply Co.
Schofield, Geo. L.
Taylor, James.

**Machinists' Tools.**
Dodge Mfg. Co.
Whiton, The D. E. Co.

**Mails.**
Walder, J.

**Measuring and Folding Machines.**
Curtis & Marble Machine Co.
Elliott & Hall.
Fabric Measuring & Packaging Co.

**Mechanical Draft.**
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Sturtevant, B. F., Co.

**Mechanical Engineers.**
American Blower Co.
Buffalo Forge Co.
Sturtevant Co., B. F.
Suck, Adolph.

**Mercantile Agency.**
Dun, R. G. & Co.

**Mercerizers.**
Blissville Mills.
Cooper Mercerizing Co.

**Mercerizing Machinery.**
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W. & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

**Mill Architects.**
See Architects & Mill Engineers.

**Mill Brushes.**
See Brushes.

**Mill Builders and Engineers.**
Ferguson, John W.

**Mill Sewing Machines.**
—See Sewing Machines and Supplies.

**Mill Supplies.**
American Supply Co.
American Textile Supply Co.
Bamford & Smith.
Barker, James.
Brigham, Arthur A.
Bristol, The, Co.
Buckley's, Benj. Son, Gun Mill.
Chase Pulley Co.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Dodge Mfg. Co.
Easton-Burnham Co.
Jefferson, Ed. & Bro.
Jeffrey Manufacturing Co.
Johnson Novelty & Mill Supply Co.
Keystone Leather Belting Works.
Lane, W. T. & Bro.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Riley, C. E. & Co.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Sweet & Doyle.
Thurston, A. G. & Son.

**Alphabetical Advertising Index, with page numbers, follows this list.**

# RUBEROID ROOFING

(Trade Mark Registered.)

## STANDARD FOR TWELVE YEARS.

The only prepared Roofing for mills, factories, foundries, etc., which has proved its ability to resist the severest conditions. Proof against water, acids, heat, alkalies, gases, fumes, etc. Fire-resisting. Practically indestructible. Outlasts tin and iron. Send for samples and Booklet I.

THE STANDARD PAINT COMPANY,

104 WILLIAM STREET, NEW YORK.


Mill Supplies—cont.

Ward & Vandegrift.
Walworth Manufacturing Co.
Watson, L. S., Mfg. Co.

**Napping Machinery.**
American Napping Machine Co.
Borchers, Richard C. & Co.
Columbia Napping Machine Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Parks & Woolsen Machinery Co.
Woonsocket Napping Machinery Co.

**Noils (Silk).**
Malcolm Mills Co.
Ryle, Wm. & Co.

**Numbering Machines.**
Force, Wm. A., & Co.

**Oil Cups.**
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

**Oil Filters.**
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.

**Oils.**
Loos & Dilworth.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

**Oilless Bearings.**
Arguto Oilless Bearing Co.

**Overhead Trolley Track.**
Putnam & Co.

**Overseaming Machines.**
Arnold Sewing Machine Co.
Champion Machine Co.
Merrow Machine Co.
Union Special Sewing Machine Co.
Willcox & Gibbs Sewing Machine Co.

**Oxidizing Machinery.**
Dubois, A. N.
Haag, A. W., & Co.

**Packing.**
Boston Belting Co.

**Paint.**
Patton Paint Co.
Standard Paint Co.

**Painting Machines.**
Patton Paint Co.

**Pantagraphs for Mill Engraving.**
Johnson, C. A., & Co.

**Paper Tubes.**
Sayford Paper Specialty Co.

**Patent Solicitors.**
Crosby & Gregory.
Howson & Howson.
Siggers & Siggers.
Straley, Hasbrouck & Schloeder.

**Perforated Metals.**
Beckley, A. J. & Co.

**Peroxide of Sodium.**
Roessler & Hasslacher Chemical Co.

**Pipes and Fittings.**
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

**Pneumatic Conveying.**
—See Ventilating.

**Power Transmission Machinery.**
Allis-Chalmers Co.
American Drying Machinery Co.
Dodge Mfg. Co.
Evans, G. Frank.
Fairmount Machine Works.
Howard Foundry & Mch. Wks.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Oneida Steel Pulley Co.
Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Saginaw Manufacturing Co.
Sellers, William & Co.
Smith, Jas., Woolen Machinery Co.
Textile Finishing Machinery Co.

**Preparatory Machinery (Cotton).**
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Smith, Jas., Woolen Machinery Co.

**Press Boards and Fenders.**
Rogers Paper Mfg. Co., Inc.

**Pressers.**
Baker Machine Co.
Birch Bros. Co. (Somerville Mchn. Works).

**Presses.**
Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Howard Foundry & Mch. Wks.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

**Pulleys.**
—See Power Transmitting Machinery.

**Pumps.**
Allis-Chalmers Co.
Goulds Mfg. Co.
Textile Finishing Machinery Co.

**Purifying & Filtration Plants.**
Scaife, W. B. & Sons.

**Rag Pickers.**
Smith, Jas., Woolen Machinery Co.

**Ramie Tops and Noils.**
Tierney, Frank A.

**Raw Hide Gears.**
New Process Raw Hide Co.

**Reed and Harness Manufacturers.**
American Supply Co.
Walder, J.

**Reels.**
Luther, C. A. & Co.

**Remnants.**
Feingold, H. & D.

**Ribbons.**
Cheney Bros.

**Ring Travelers.**
National Ring Traveler Co.
Shaw, Victor, Ring Traveler Co.

**Roofing.**
Standard Paint Co.

**Rope and Twine Machinery.**
Haskell-Dawes Machine Co., The

**Rope Transmissions.**
Dodge Mfg. Co.

**Roving Cans.**
Hill, James, Mfg. Co.
Laminar Fibre Co.
N. E. Ventilating & Heating Co.
Walrus Fibre Mfg. Co.

**Alphabetical Advertising Index, with page numbers, follows this list.**


# CATCH THE DUST

IN YOUR MILL OR FACTORY BY USING AN

## ALLINGTON OR MARSHALL

## Dust Collecting System

ALLINGTON & CURTIS MANUFACTURING CO., Saginaw, Mich.

# IN ACTUAL SERVICE

**Our RUBBER COVERED ROLLERS**

**repeatedly show their superiority and durability**

NEW ROLLERS COMPLETE

OLD ROLLERS RECOVERED

We make rubber coverings which are perfectly adapted for all textile purposes—dyeing, printing, mercerizing, squeezing, wool washing, fulling, carbonizing, etc.

Write for our RUBBER COVERED ROLLER pamphlet and let us estimate on your requirements.

**Mechanical Rubber Goods** of every description

Manufactured by

# BOSTON BELTING COMPANY

*JAMES BENNETT FORSYTH, Gen'l Mgr.*

BOSTON NEW YORK BUFFALO PHILADELPHIA BALTIMORE ATLANTA


**Rubber Covered Rollers and Goods.**
Boston Belting Co.

**Rubberoid Roofing.**
Standard Paint Co.

**Saddles and Stirrups.**
Dixon Lubricating Saddle Co.

**Scales.**
Sweet & Doyle.

**Scallop Machines.**
Merrow Machine Co.

**Schools.**
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

**Secondhand Machinery.**
——See Mchry. Dealers also classified ads.

**Screens (Perforated).**
——See under Perforated Metal.

**Selling Agents.**
——See Commission Merchants.

**Separators.**
Draper Co., The.

**Sewing Machines and Supplies.**
American Overstitch Machine Co.
Arlington Machine Works.
Arnold Sewing Machine Co.
Birch Bros. Co. (Somerville Mchn. Works).
Champion Machine Co.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Somerville Machine W'ks, Birch Bros. Co.
Textile Finishing Machinery Co.
Union Special Sewing Machine Co.
Willcox & Gibbs S. M. Co.

**Shafting, Hangers, Etc.**
——See Power Transmission Machinery.

**Shearing Machinery.**
——See Dyeing, Drying, Bleaching and Finishing.

**Sheet Metal Work.**
Barney Ventilating Fan Works.

**Shell Rolls.**
Thurston, A. G. & Son.

**Shoddies.**
——See Wool Shoddies.

**Shuttles.**
——See Bobbins, Spools, Shuttles, Etc.

**Silk Machinery.**
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

**Silk Mill Supplies.**
Hall, I. A. & Co.

**Singe Plates.**
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Taunton, New Bedford Copper Co.

**Singeing Machines.**
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Knapp, Charles H.
Somerville Machine W'ks, Birch Bros. Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

**Sizing, Starch and Gums.**
Arabol Mfg. Co.
Elwell, Henry A. & Co.
O. K. Soap Co.
Stein, Hirsch & Co.

**Skylights.**
Drouve, G., Co.

**Slashers.**
Lowell Machine Shop.
Riley, C. E. & Co.

**Smokestacks.**
Allen, Wm. & Sons Co.

**Soaps.**
American Soap & Washoline Co.
India Alkali Works.
O. K. Soap Co.
Rome Soap Mfg. Co.

**Spindles.**
Bamford & Smith.
Buckley, Benjamin, Sons, Gun Mill.
Draper Company.
Easton-Burnham Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Ward & Vandegrift.
Whitin Machine Works.

**Spindle Tubes.**
Bamford & Smith.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

**Spinning Cylinders.**
N. E. Ventilating & Heating Co.

**Spinning Frames.**
——See Cotton Machinery.

**Spinning Rings.**
Draper Company.
Whitinsville Spinning Ring Co.

**Spinning Tubes.**
Buckley, Benjamin, Sons, Gun Mill.

**Spools.**
——See Bobbins, Spools, Shuttles, Etc.

**Spoolers.**
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Payne, George W. & Co.

**Stamps for Hosiery.**
Atlas Copper Stamp Works.
Wells, Wilfred.

**Steam Boilers.**
Allen, Wm. & Sons Co.

**Steam Boiler Insurance.**
Hartford Steam Boiler Inspection & Insurance Co.

**Steam Boxes.**
Allen, Wm. & Sons Co.

**Steam Engines.**
Allis-Chalmers Co.
American Blower Co.
Atlas Engine Works.
Birch Bros. Co. (Somerville Mchn. Works).
Buffalo Forge Co
Fishkill Landing Machine Co.
Harrisburg Foundry & Machine Co.
Hooven (The), Owens & Rentschler Co.
Sturtevant, B. F. & Co.
Textile Finishing Machinery Co.

**Steam Jacket Kettles.**
Badger, E. B. & Sons Co.

**Steam Pumps.**
Goulds Manufacturing Co., The.

**Steam Specialties.**
Butterworth, H. W., Sons Co.
Crosby Steam Gage and Valve Co.
Lunkenheimer Co.
Mason Regulator Co.
Pittsburgh Gage & Supply Co.

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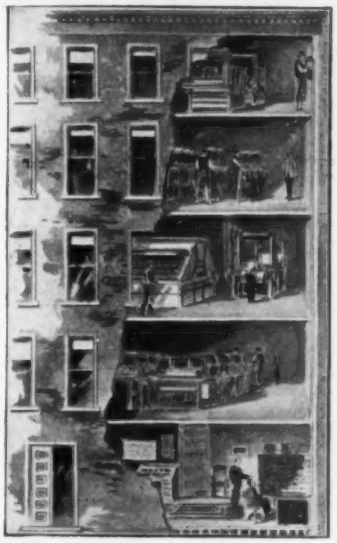
# Interior Telephones



## Save Time

AND TIME IS MONEY

¶ Every textile mill of any proportions should have an Interior Telephone System. Instruments will save their cost in two months. ¶ Ask for our new Intercommunicating Telephones. ¶ We are the largest manufacturers of telephones in the United States and perhaps in the world, and we can assure you in every way of superior service. We guarantee all our instruments for one year after installation.

SEND FOR OUR CIRCULAR GIVING PRICES AND OUR SPECIAL BULLETIN, No. T1.

## STROMBERG-CARLSON TEL. MFG. CO.

West Jackson Blvd., ... CHICAGO, ILL.


Steam Sphcialties—cont.
Sturtevant Co., B. F.
Textile Finishing Machinery Co.
Walworth Manufacturing Co.

**Steam Traps.**
Albany Steam Trap Co.
Lunkenheimer Co.

**Stop Motion for Looms.**
——See Warp Stop Motions.

**Tanks, Tubs and Vats.**
Caldwell, W. E. Co.
Cypress Lumber Co.
Hall, Amos H. Son & Co.
Lewis, H. F. & Co.
Stevens, D. B. & Co.
Textile Finishing Machinery Co.
Woolford, George, Tank Mfg. Co.

**Tapes, Braids and Edgings.**
Cathcart, John & Co.
Chapin, George W.
Friedberger Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

**Telephones.**
Allen-Hussey Co.
Stromberg-Carlson Tel. Mfg. Co.

**Temples.**
Draper Co.

**Tension Pulleys.**
N. E. Ventilating & Heating Co.

**Tentering Machines.**
——See Dyeing, Bleaching Machinery, Etc.

**Tenter Clips.**
——See Dyeing, Drying, Bleaching and Finishing Machinery.

**Testing Machines.**
Howard Foundry & Machine Works.

**Textile Schools.**
——See Schools.

**Thread Board for Spinning & Twisting Frames.**
Houghton, L. T.

**Thread Dressers or Polishers.**
Luther, C. A. & Co.

**Ticketing Machinery.**
See Labeling Machines.

**Tower Clocks.**
Howard, E., Clock Co.

**Tube Cleaners.**
Harrison, Newman

**Turbine Governors.**
Replogle Governor Works.

**Turbines.**
——See Water Wheels.

**Twine Machinery.**
Brownell, G. L.
Haskell-Dawes Machine Co.

**Twisting Machinery.**
Brownell, G. L.

**Valves.**
Boston Belting Co.
Lunkenheimer Co.

**Ventilating Apparatus.**
Allington & Curtis Mfg Co.
American Air Moistening Co.
American Blower Co.
American Drying Machinery Co.
Barney Ventilating Fan Works.
Berry, A. Hun.
Boston Blower Co.
Buffalo Forge Co.
Drouve Co., G.
Massachusetts Fan Co.
New England Ventilating & Heating Co.
Nichols, E. M.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co.

**Warping and Beaming Machinery.**
Draper Co.
Entwistle, T. C., Co.
Fairmount Machine Co.

**Warp Stop Motions.**
Draper Co.
Stafford, George W. Co., The.

**Washers (Cloth).**
Birch Bros. Co.
Butterworth, H. W. & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Somerville Machine W'ks, Birch Bros. Co.

**Washing Soda.**
Ford, J. B., Co.

**Watchman's Clocks.**
Howard, E., Clock Co.
Imhauser, E. & Co.
Nans & Co.
Riggs & Brothers.

**Water Purifiers & Filters.**
Scaife, W. B. & Sons.

**Water Towers.**
Caldwell, W. E., Co.

**Water Wheels.**
Hunt, Rodney, Machine Co.
Leffel, James & Co.
Risdon-Alcott Turbine Co.
Smith, S. Morgan, Co.

**Water Wheel Governors.**
Cohoes Foundry & Machine Co.
Leffel, James & Co.
Replogle Governor Works.

**Whistles.**
Lunkenheimer Co.

**Winders.**
Allen, A. W.
Altemus, J. K.
Brigham, Arthur A.
Foster Machine Co.
Lindsay, Hyde & Co.
Payne, George W. & Co.
Universal Winding Co.

**Winders. (Back.)**
Taylor, James.

**Winder Bobbins.**
Sweet & Doyle.

**Winders. (Hosiery).**
Altemus, Jacob K.
Brigham, Arthur A.
Foster Machine Co.
Leighton Machine Co.
Lever, Oswald.
Payne, G. W. & Co.
Universal Winding Co.

**Wood Pulleys.**
Dodge Mfg. Co.
Oneida Steel Pulley Co.
Pittsburgh Gage & Supply Co.
Saginaw Manufacturing Co.

**Alphabetical Advertising Index, with page numbers, follows this list.**

**Wool.**
Justice, Bateman & Co.
Stoddard, Haserick, Richards & Co.
Tierney, Frank A.

**Wool Cleaning Compound.**
Ford, J. B., Co.
India Alkali Works.

**Wool Combing Machinery.**
Crompton & Knowles Loom Works.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

**Wool and Waste Dusters.**
Atlas Foundry & Machine Co.
Gerry, Geo. & Son.
Sargents', C. G., Sons.
Smith, Jas., Woolen Machinery Co.

**Wool, Non-shrinking Process for.**
Heyer, Charles H.

**Woolen and Worsted Machinery.**
Altemus, Jacob K.
American Drying Machinery Co.
American Tool & Machine Co.
Atlas Foundry Machine Works.
Barker, James.
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Fales, L. F.
Fairmount Machine Works.
Firth, William, Co.
Gessner, David.
Harwood, Geo. S. & Son.
Hood, R. H.
Howard Foundry & Machine Works.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Ed. & Bro.
Kenyon, D. R. & Son.
Leigh, Evan A.
Lever, Oswald.
Lowe, Stephen C.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Smith, Jas., Woolen Machinery Co.
Somerville Machine W'ks, Birch Bros. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William & Sons, Ltd.
Woonsocket Machine & Press Co.

**Wool Oiling Apparatus.**
Harwood, Geo. S. & Son.

**Wool Shoddies.**
Becker, C. W.
Riverdale Woolen Co.
Slack, Wm. H. H. & Bro.

**Wool Washing, Preparing and Drying Machinery.**
American Drying Machinery Co.
Hunter, Jas., Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

**Wool Waste.**
Graves, Frank B.

**Yarn Printing Machines.**
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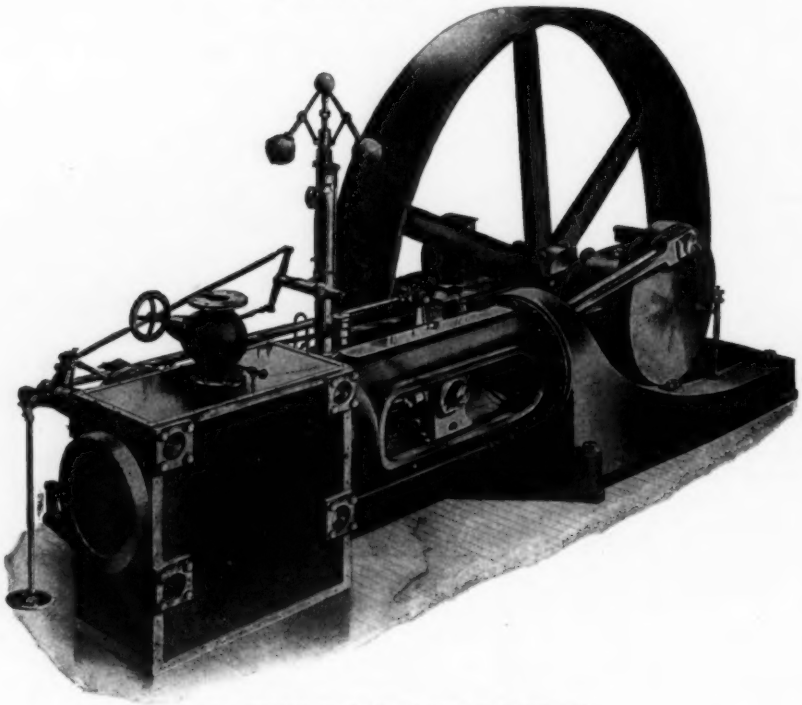

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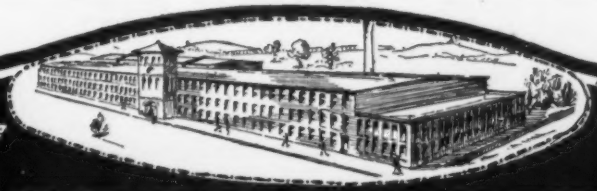

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**Superintendent.** Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 2095, Textile World Record.

**Superintendent and Designer.** Has had 18 years' experience in weaving room, 12 years being in charge of rooms in some of the best mills in New England on fine yarns and fancies and designing. Qualified for superintendent's place. 2098, Textile World Record.

**Cotton Mill Superintendent,** or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

**Superintendent Cotton Mill,** or would take an overseer's position in large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery. 1853, Textile World Record.

**Superintendent.** Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

**Cotton Mill Superintendent.** Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

**Situation Wanted** by a practical man as working superintendent in a flax, tow, hemp or jute factory, making all kinds of yarn, threads, twines, etc. Best of references. 533, Textile World Record.

**Superintendent,** or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

**Superintendent.** Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds. 1841, Textile World Record.

## WOOLEN SUPERINTENDENTS.

**Superintendent** of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1982, Textile World Record.

**Superintendent,** woolen or worsted. Been overseer of weaving and superintendent in New England mills. Age 44, married; American. 1785, Textile World Record.

**Woolen Mill Manager,** formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

**Agent,** or superintendent, or superintendent and designer. Good manager of help and a hustler. Thoroughly understands manufacture of shoddy in all its branches, including carbonizing and extracting. Familiar with all manipulations of wool, shoddy and cotton. Fully competent to take agent's position, as is a good wool buyer, and can figure all prices on goods and percentages, etc. 2053, Textile World Record.

**Manager or Superintendent** of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

**Assistant Superintendent** or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots, kerseys, meltons and fancy cassimeres. Technical education acquired at Philadelphia Textile School. Six years' practical experience, three as designer. Age 24; American; good references. Will go anywhere. 1974, Textile World Record.

**Superintendent or Designer,** an American, married, 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage. 1936, Textile World Record.

**Superintendent.** American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

**Superintendent** woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

**Superintendent of Woolen or Worsted Mill,** who understands designing, is open to a position. 23 years of age; an American; single. Well recommended, and with good experience. 1891, Textile World Record.

**Supt. of Cotton Mill,** or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

## COTTON CARDERS.

**Carder in Cotton Mill.** Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

**Overseer of Carding.** Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

**Overseer of Carding.** Age 39; married. Worked on coarse and fine numbers and combers. American and English machinery. 3012, Textile World Record.

**Overseer of Carding** or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

**Overseer Cotton Carding or Spinning** desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

**Boss Carder.** Aged 28. Worked on plain goods. Will go South or anywhere. Steady man, and excellent references. Also a frame spinner. 1759, Textile World Record.

**Overseer or Second Hand of Cotton Carding.** Age 33; German; married. Hosiery yarns, sheetings, prints, all grades of cotton from waste to Egyptian cotton from 80 to 1600 hank. Not at present employed. Good experience and references. 3026, Textile World Record.

**Overseer of Carding or Ring Spinning.** Age 35; American. Sheetings, prin ♦ and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

**Carder and Spinner,** also twister, spooler and winder. Will go anywhere, but prefers New York state. Age 30; American. Shoddies and cotton mixes, camel hair, noils from 1 to 7 run for weaving or knitting. 2082, Textile World Record.

## WOOLEN CARDERS.

**Overseer of Woolen Carding,** age 32; American; married. Good experience and excellent references. Worked in kerseys, meltons, cheviots, cassimeres, coverts, dress goods, broadcloths, etc. 2060, Textile World Record.

**Overseer for Washing,** Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2083, Textile World Record.

**Carder,** or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

**Overseer of Woolen Carding.** Age 26; American. Familiar with all American cards. Worked on cotton, wool, shoddy, noils and mixes. Strictly temperate. Will not go West or South. Refers to past employers. 3023, Textile World Record.

**Overseer of Carding and Spinning.** Middle aged; English; married. Dress goods, flannels, blankets, overcoatings and plush goods. English and American makes of machinery, also an expert on the Bollette condenser. 2079, Textile World Record.

**Overseer Wool Carding,** experienced on all kinds of stock, wool and cotton, wool, cotton and shoddy mixes, thoroughly up to date. Good manager of help, a hustler, and not afraid to work. Strictly temperate, steady and reliable. American, 43 years of age. Best of references. 1953, Textile World Record.

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**Woolen Boss Weaver.** Steady, reliable and an excellent man in a weave room. Has worked on almost all kinds of woolen goods, and is familiar with Crompton & Knowles looms. Will accept position for not less than $2.50 per day. 2088, Textile World Record.

**Boss Weaver or Designer,** or could fill a position as all around man in a small mill. Age 42; Scotch; married. Worked on fancy cashmeres, blankets, flannels, carriage robes, and other fancy goods. Is familiar with Crompton & Knowles, Davis & Furber, and other looms. Wants to go West or South. 1940, Textile World Record.

**Overseer of Weaving** or assistant superintendent. Age 33; English; married. Worked on prints, sheetings, colored goods, etc. Prefers New England. Good experience, and first-class references. 3041, Textile World Record.

**Overseer of Weaving** or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2052, Textile World Record.

**Boss Weaver** or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

**Overseer of Weaving,** or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

## WOOLEN WEAVERS.

**Overseer of Cotton Weaving.** Sheetings, sateens and all kinds of fancies from 2 to 24 harness, lenos, lappets and jacquard. Age 32; English and married. 1934, Textile World Record.

**Boss Weaver,** who is familiar with cotton, woolen and worsted looms and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills. 1959, Textile World Record.

**Overseer of Weaving** in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

**Practical Boss Weaver** and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

**Overseer of Weaving.** Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

**Young Man.** American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

## COTTON SPINNERS.

**Overseer of Mule Spinning** who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

**Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with. 1690, Textile World Record.

**Secondhand Spinner.** Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

**Second Hand on Mules.** Has had 20 years' experience on cotton mule spinning as mule fixer and second hand. Age 39, with family. Good references. 1950, Textile World Record.

**Boss Ring or Mule Spinner.** Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

**Overseer of Cotton Mule Spinning.** Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

**Overseer of Ring Spinning.** Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 2018, Textile World Record.

**Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703, Textile World Record.

## WOOLEN SPINNERS.

**Overseer** of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

**Overseer Woolen Spinning.** Is thoroughly competent to take charge of a large spinning room. 28 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

**Worsted Spinner or Section Hand.** Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

**Overseer of Ring or Frame Spinning,** or would take superintendent position. Age 41; married. 2040, Textile World Record.

**Boss Spinner.** Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

**Overseer of Woolen Spinning.** Age 44; American; married. Worked on cassimeres, flannels, tweeds and dress goods. Johnson & Bassett and Davis & Furber mules. Will not go West or South. Good experience and first-class recommendation. 3049, Textile World Record.

## DYERS.

**Dyer.** Second-hand in large house, or boss dyer in small reliable woolen mill. Would accept good offer as chemist to some mill. Age 25; American. Textile graduate, and has held various positions in the laboratory and with dyestuff dealers during past three years. 2097, Textile World Record.

**Dyer,** Scourer and Bleacher in knitting mill. Age 39; married. All grades of underwear, spring and latch needles. First-class recommendations. Will not go West or to Canada. 3004, Textile World Record.

**Dyer** on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

**Overseer of Dyeing and Bleaching.** Age 38; Scotch, married. Denims, awnings, ticking, outing flannel and madras. First-class references. 3022, Textile World Record.

**Boss Dyer and Bleacher.** Age 34; English; married. Yarns, warps, knit goods. Can give good references. Wants $4 or more. 3020, Textile World Record.

**Expert Hosiery Dyer.** Age 27; married and sober. Desires position of superintendent of dyeing in a first-class hosiery mill, one manufacturing high grade goods preferred. Has had over seven years' practical experience in dyeing one of the best aniline blacks on cotton, also fast colors on cotton, wool, silk and union hosiery. Best of references furnished. 2052, Textile World Record.

**Boss Dyer.** German. Fifteen years' practical experience. Would like to go West or South. Worked on yarn, piece goods, raw stock, knit goods and hosiery. Can furnish references. 3045, Textile World Record.

**Practical Dyer** is open for engagement and would like to correspond with responsible firm. Has a thorough knowledge of the dyeing of hosiery and underwear, cotton, wool, and mixed goods in all percentages, balbriggans, etc. In last position 9 1/2 years. 1513, Textile World Record.

## FINISHERS.

**Finisher of Cotton Goods,** also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

**Finisher,** both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

**Cotton Finisher.** Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

**Overseer of Finishing,** worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

**Overseer of Finishing.** Prefers a satinet mill. Eight years' experience as overseer. Aged 47. 3017, Textile World Record.

**Overseer of Warping, Spooling and Winding.** Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

**Boss Finisher.** Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

## KNITTERS.

**Foreman Knitter** in underwear mill. Age 30; American. Familiar with Campbell & Clute, Tompkins, Scott & Williams and Cooper machines. 3038, Textile World Record.

**Knitter.** Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

**Boss Knitter.** finisher or machinist. Worked on nearly all kinds of knit goods, and nearly all kinds of latch needle knitting machines and all kinds of machines used in finishing underwear. 889, Textile World Record.

**Overseer Boarding** and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

**Superintendent Hosiery Mill.** Age 22; American; single. Worked on 84 needle goods. Prefers position in the South. 3033, Textile World Record.

**Foreman or Second Hand of Knitting Room.** Married; 30 years old. Nine years' experience on hosiery and some on underwear. Familiar with several different makes of full automatic hosiery machines, including Mayo, Standard, Victor, Scott & Williams. Wants a place where he will have steady work. Worked on wool, cotton and lisle. 2093, Textile World Record.

**Fixer** on rib machines, loopers and sewing machines. An American; married. Not employed and wants position at once. Will not go South. 3050, Textile World Record.

## DESIGNERS.

**Designer** in small mill or assistant in large mill. Age 22; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trouserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion. 1837, Textile World Record.

**Smart Designer,** high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start. 1816, Textile World Record.

**Assistant Designer** on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references. 1923, Textile World Record.

**Designer or Assistant Superintendent** desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1996, Textile World Record.

**A Young Man,** 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

**Designer** or Assistant Designer. Woolens and Worsteds. Five years' experience in the Pattern Room as weaver and foreman. Conversant with all the details, practical and technical. First-class references. English; married; age 28. 3031, Textile World Record.

## MISCELLANEOUS.

**Loom Fixer.** Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

**Overseer of Spooling,** warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

**Spare Hand Loom Fixer.** Wants place where he can settle down. Is familiar with Crompton & Knowles looms. Age 40. 2091, Textile World Record.

**Master Mechanic** in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

**Colorist** and color mixer for all kinds of printing. Also understands plush printing and extract work. 10 years' experience. Can give references. 2045, Textile World Record.

**Master Mechanic** wishes position in the North. 35 years old; married. Worked 15 years on repairs. Wants $3.50 per day. Has license for running engines and boilers Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing. Understands cotton mill repairs as good as the best man at such work. 2025, Textile World Record.

**An Expert** on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old; English; married. Has worked for one concern in the United States for 12 years. 1980, Textile World Record.

**Paymaster or Bookkeeper.** Agent or Manager wood or iron working plant or small cotton mill. 23 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States. 1881, Textile World Record.

**A Second-class Engineer,** 48 years of age, American, would like a position as such in a N. E. mill. Is steady and reliable. Good references from former employers. 1965, Textile World Record.

**A Young Man** who thoroughly understands the keeping of mill books would like a position in the Southern States or would go to Cuba or Puerto Rico. Is a first-class man and perfectly familiar with general office work. An American; 22 years of age; single. Steady and reliable, and can give good references. 1914, Textile World Record.

**Overseer of Cone Winding** and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

**Paymaster and Cashier** with 10 years' experience, wants position. Good references and can give bond if required. 1877, Textile World Record.

**Asst. Superintendent.** Young man, 26, graduate of Lowell Textile School (Woolen and Worsted Course). Has had considerable experience in setting up machinery, and worked in nearly every department of mill. Wants position in which there is a good chance to advance. 3040, Textile World Record.

**Second Hand** in cloth room desires position. At present has charge of samples in large mill. Has worked on all classes of cotton goods. Strictly temperate. 3048, Textile World Record.

## *JUST PUBLISHED*

# Mercerization

*By the Editors of the "Dyer and Calico Printer," England*

No book on Mercerization has appeared in any language, with the exception of the German work of Paul Gardner, published in 1898. Since that date, processes have undergone great developments, and Gardner's work, excellent as it is, is somewhat out of date. With the view of bringing this subject up to date and treating it in an exhaustive manner, the editors of the *Dyer and Calico Printer* have prepared this new work, which they have endeavored to make of value to the actual users and students of the process of Mercerization. It has been received with great success in Great Britain, and we believe will meet with an equally gratifying reception in this country. It should be in the office of every chemist who has to do with this process and should find a place in all scientific and technical libraries.

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**VOLUME II.—CONTAINS ABOUT 380 PATTERNS.**

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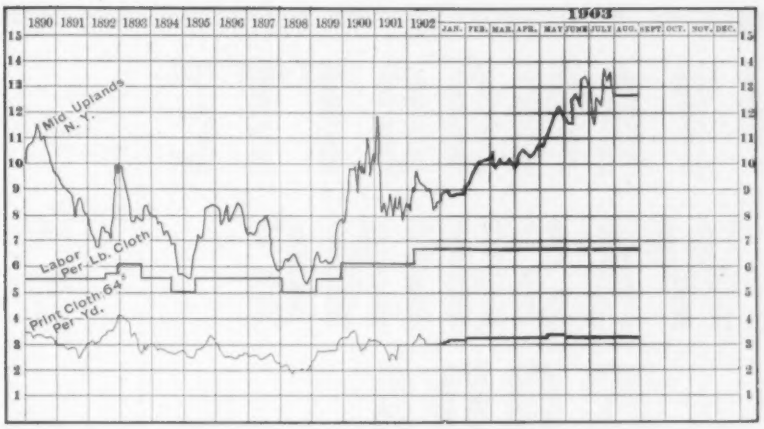
## Lord & Nagle Company

95 SOUTH STREET, BOSTON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1903
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid. Uplands N. Y.
Labor Per Lb. Cloth
Print Cloth 64" Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

## The Cotton Market.

A continued deadlock is the feature of the cotton market. The stock of old cotton on hand is small, of poor quality and largely in the possession of speculators. The world's visible supply on Aug. 22 was estimated by the Chronicle as follows:

| | 1903 | 1902 | 1901 | 1900 |
|---|---|---|---|---|
| East India | 745,000 | 593,000 | 701,200 | 486,200 |
| American | 580,583 | 841,000 | 1,017,372 | 607,767 |
| | 1,325,583 | 1,434,627 | 1,718,572 | 1,093,967 |

It will be noticed that the stock of American cotton, 580,583 bales, is now less than on the same date is either of the preceding three years. The Indian cotton makes a good showing, but it is not what the world wants. It is short, dirty and tender, fit only for cheap, coarse goods. The scarcity of American cotton has resulted in bringing into sight a large amount of Indian cotton, of which the visible stock is now larger than for three years.

Cotton mills throughout Europe and America are curtailing production and there is no question but that the actual supply of raw cotton visible and invisible is at the vanishing point. The "first bale" of the new crop has made its appearance in many parts of the South, but a supply of new cotton is not expected much before the first of October. Since our last report prices have been steady and 12¾ cent cotton continues to cheer the South with bright prospects for the future.

The goods market is in a waiting condition. The general stopping of the mills has strengthened prices somewhat, but there is still a large deficit facing the mill owner who buys cotton and sells goods at today's prices.

New York. Fultonville. The Starin Silk Fabric Company has resumed operations in the plant. They are in need of more help. It is thought from the present outlook that the plant will run steadily all winter.

*Rhode Island, Pawtucket. The Star Hair Cloth Company, reported incorporated in a previous issue as located at Providence, operates a mill at this place. Twenty looms are running, making hair cloth.

Rhode Island, Valley Falls. Operations have been suspended for one week in the Penikees Silk Mill, Reiling, David & Schoen, proprietors, for purpose of taking account of stock.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

AMERICAN SOAP AND WASHOLINE CO.

Textile, Laundry and Powdered
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140-180 Central Avenue,
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Established 1861. Reorganized and Incorporated 1898.

# WYANDOTTE WASHING SODA

IS to the Woolen Mill industry for the purpose of scouring wool or washing the finished cloth as cream, compared with milk, to the coffee.

A natural product, it produces in the scoured wool or the washed cloth that soft, lofty effect which every mill is striving to get and maintain.

Mill men need not accept our unsupported testimony for these facts as we guarantee Wyandotte Washing Soda to be, and do, all we claim for it or to cost you nothing. Then make your own test that you may know the valuable properties of this material.

## ARE YOU USING

Wyandotte Washing Soda, if not, begin at once. It is well worth your consideration. The effect produced by using Wyandotte Washing Soda becomes much more noticeable when compared with the results obtained from soda ash, sal soda, or harsh alkalies. There will be no deadened fibre to leave the goods with that harsh feel.

Place your order with your supply house for from five to ten barrels and satisfy yourself of the good qualities of Wyandotte Washing Soda.

We make you a proposition which protects you from all loss.

**The J. B. FORD CO., Sole Mfrs., WYANDOTTE, MICH.**

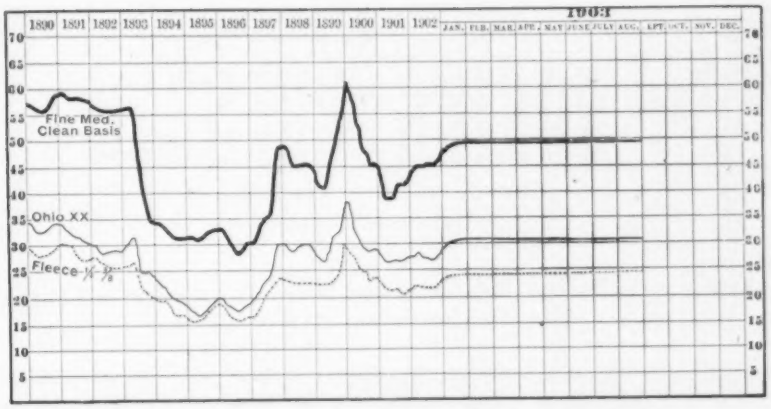


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

## The Wool Market.

A slightly weaker tone has prevailed in the wool market during the past month. This has been due to the large amount of idle machinery at a time when the mills should be receiving orders for light weight goods. A contributing factor is the tightness of the money market, which has restricted buying and made some holders of wool disposed to part with their property and thus reduce their obligations at the banks. The light weight season has opened unsatisfactorily and manufacturers see no necessity for filling mill storehouses with wool while looms are idle, because the product cannot be sold. The demand for wool is strongest on medium and low grades, and some good-sized orders from large mills are reported. The new clip is moving freely to the East and the prices at which it was bought in the West prevent any consessions on current quotations except at a loss. The end of the Philadelphia textile strike marks the removal of one depressing factor, although this gain is balanced by the voluntary closing of Eastern mills. Generally considered the wool trade is in a healthy condition. Prices are high, too high to admit of a further rise without meeting the obstruction offered by an increased use of shoddy and cotton. On the other hand the general prosperity of the country makes a material decline extremely improbable. The stopping of mills is a healthy sign. It means that when buyers want goods, their orders will mean work for the looms.

Never Shrink

SOMETHING NEW

*Prevents Wool from Shrinking*

Address
Charles H. Heyer
BUSTLETON, ... ... PENN.

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JUSTICE, BATEMAN & CO.
**Wool Commission Merchants,**
122 South Front St., PHILADELPHIA.

**Standard Quality Combed Ramie Top and Noils a Specialty**

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Wool Tops.
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Hydraulic or Knuckle Joint
Any Size .. Any Power

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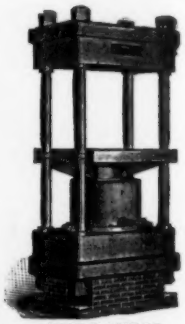

HYDRAULIC.

EASTON AND BURNHAM MACHINE CO.,
Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

# WEIMAR BROS.

MANUFACTURERS OF
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SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

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Manufacturers of

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# LOOK!

THE BRANDEN RUBBER PUMP VALVE
Will Outlast Three Ordinary Valves.

Made for hot or cold water or any fluid where rubber valves are used. By its construction will outlast several ordinary valves. A trial will demonstrate the truth of our statements.

JOHNSTONE BLOW-OFF VALVE. A most durable and useful valve.

Pressure and Vacuum Gages. Pop Safety Valves.
Steam Engine Indicators. Whistles, Lubricators, Etc., Etc.

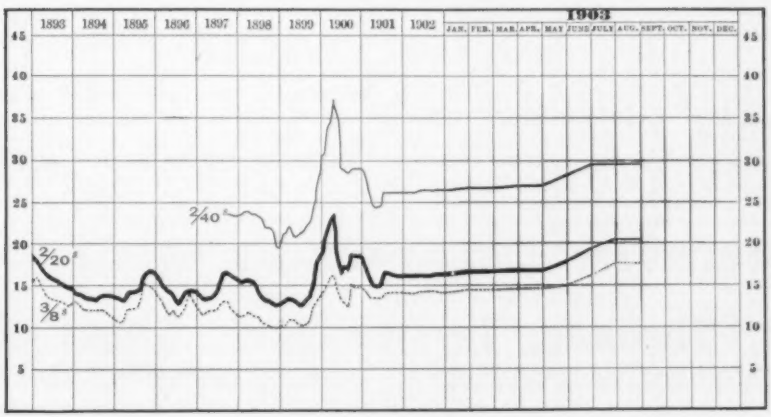
CROSBY STEAM APPLIANCES ARE UNEXCELLED.

CROSBY STEAM GAGE AND VALVE CO.,

Stores: Boston, New York, Chicago, London.

Office and Works: BOSTON, MASS.

# Yarn Department.




GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

## The Cotton Yarn Market.

The business in this market since our last report has been small in volume but prices have been fairly maintained at a level corresponding to 13-cent cotton. With no cotton on hand spinners have been forced to fix a price for yarn that would at least show a new dollar returned for an old one. Knit and piece goods have not advanced in proportion, and consequently the yarn spinners have quoted high prices but been unable to do much business. In a few quarters there have been indications of a willingness on the part of the spinners to make concessions, but this feature of the situation has not been pronounced.

The trade is becoming convinced that cotton will remain at a much higher level than that of recent years. Of course buyers will resist this advance as much as possible; that is good business; but the law of supply and demand will prove the stronger.

Many knitting mills have shut down on account of the advance in cotton and this has increased the prevailing dullness of the yarn market while serving to strengthen the goods market. Jobbers and retailers have adopted a waiting policy, in the expectation that a decline in the price of spot cotton will be followed by a lowering of the prices for goods. In this they are likely to be disappointed because the goods market is now far below the level of the raw cotton market. The price for cotton may drop but that will only serve to restore normal conditions.

Yarn prices are in a measure nominal.

We quote as follows:

Eastern Cops.

| | |
|---|---|
| 6's | 20¾ |
| 8's | 21 |
| 10's | 21¼ |
| 14's | 22¼ |
| 16's | 22¾ |
| 22's | 24 |
| 24's | 24½ |
| 26's | 25 |
| 30's | 26 |
| 34's | 27 |
| 36's | 27½ |
| 40's | 28½ |

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

| | |
|---|---|
| 12's | 20½-21 |
| 14's | 21-21½ |
| 18's | 23-23½ |
| 20's | 24 |
| 22's | 24½ |
| 26's | 25 |
| 28's | 26 |
| 30's | 27 |
| 36's | 29 |
| 40's | 31 |
| 45's | 33 |
| 50's | 36 |
| 55's | 39 |
| 60's | 46 |

Eastern Two-Ply Warps, Carded Peeler.

| | |
|---|---|
| 2/30's | 27-28 |
| 2/36's | 29-30 |
| 2/40's | 32-33 |
| 2/45's | 34-35 |

# THE J. R. MONTGOMERY CO.,

**Windsor Locks, Conn.**

MANUFACTURERS OF

**Mercerized Cotton Yarns** Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

**Novelty Yarns** Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

**Cotton Warps** on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

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## GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

**Yarns, Threads, Twines and Chain Warps,**

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

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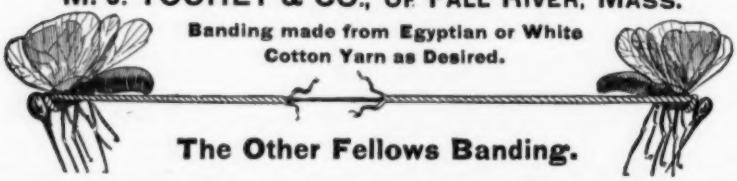
THESE MULES CANNOT BREAK THE BANDING —MADE BY—

**M. J. TOOHEY & CO., OF FALL RIVER, MASS.**

Banding made from Egyptian or White Cotton Yarn as Desired.



**The Other Fellows Banding.**

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## MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

**COTTON WARPS**

HOUSATONIC, MASS.

4s to 60s.

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## Dana Warp Mills

WESTBROOK, .. .. MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

| | |
|---|---|
| 2/50's | 37-38 |
| 2/60's | 45-46 |

Egyptian Weaving Yarns.
Single Skeins Combed.

| | |
|---|---|
| 30's | 38-39 |
| 35's | 40½ |
| 40's | 42½ |
| 45's | 44 |
| 50's | 46 |
| 55's | 52-53 |
| 60's | 56 |
| 70's | 60 |

Two and Three Ply Skeins, Combed.

| | |
|---|---|
| 30's | 44 |
| 36's | 45½ |
| 40's | 48½ |
| 45's | 51 |
| 50's | 54 |
| 55's | 56 |
| 60's | 60 |
| 70's | 67½ |

## The Philadelphia Yarn Market.

There has been very little change in the yarn situation during the past month. The demand has been fully equal to the supply. Prices have been very well maintained but there has been a disposition on the part of spinners to make contracts for delivery on new cotton at concession on present prices. Buyers of yarn, for prompt delivery, are compelled to pay prices based on 13-cent cotton and spinners are firm in their prices for prompt delivery.

The market is still bare of stock and the outlook for business this fall is good, and there will be sufficient demand to prevent any accumulation in the near future.

It looks as if cotton would rule high all this coming year, and the corner in cotton during the past few months has taught spinners a lesson which they will not soon forget. There is practically no cotton at all being carried over. Most spinners are entirely out, which will make a lively demand for the early pickings.

The knitting and weaving mills have been having considerable trouble in getting an advance on their goods, to cover the increased cost of yarn, but with cotton ruling high this season there must necessarily be a readjustment of prices on manufactured goods.

We quote as follows:

Southern frame cones (good quality):—

| | |
|---|---|
| 7's and coarser | 19-19½ |
| 8's and 9's | 19½-19¾ |
| 10's | 19½-20 |
| 12's | 20-20½ |
| 14's | 20½-21 |
| 16's | 21¼-21½ |
| 18's | 21½ |

BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 LEONARD STREET, NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL & CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
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CATLIN & CO.,
Yarns.
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216 CHURCH STREET, NEW YORK.
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Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED .·. YARN .·. SPECIALTIES

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
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FRED STERNBERG & CO.
Successors to EICHMANN & STERNBERG,
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MERCERIZED / TURKEY RED / GASSED } COTTON YARNS.
JACQUARD and HARNESS TWINES.

J. S. DODDS,
346 Broadway, N. Y. Life Bldg., New York, N. Y.
MERCERIZED
YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

# Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

## THE MALCOLM MILLS CO.,

MANUFACTURERS OF

## FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

TRADE MARK E-G YARNS CLOTH

**ENGLISH-GREENE CO.**

Commission Merchants,

Greene Bldg., 26 Fountain St., Prov., R.I.
72 Leonard St., New York.
300 Chestnut St., Phila.

Consignments Solicited for Southern Mills. Liberal Advances Made and Sales Cashed Promptly.

# SAVOGRAN

Cleans Wool, Floors, Anything.

**INDIA ALKALI WORKS, Boston.**

**Indian Orchard Company.**

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

F. Morgan, Pres. H. K. Wright, Treas. W. C. Godfrey, Agt.

Indian Orchard, Mass.

| | |
|---|---|
| 20's | 22 |
| 22's | 22½ |
| 24's | 23 |
| 26's | 23½ |
| 30's | 25 |
| 40's | 29-29½ |
| 50's | 36 |

Southern high grade mule yarn:—
Cones.

| | |
|---|---|
| 10's | 21 |
| 12's | 21½ |
| 14's | 22 |
| 16's | 22½ |
| 18's | 23 |
| 20's and 22's | 23½-24 |
| 24's | 25 |

Southern frame yarn, lower grades:—

| | |
|---|---|
| 6's and 8's | 18-18½ |
| 10's | 19-19½ |

Eastern cones (high grade quality):—

| | |
|---|---|
| 10's | 22-22½ |
| 12's | 22½-23 |
| 14's | 23-23½ |
| 16's | 23½-24 |
| 18's | 24-24½ |
| 20's and 22's | 24½-25½ |

Lower grades Eastern yarn:—

| | |
|---|---|
| 6's and 8's | 18½-19 |
| 10's | 20 |

Rise ¼c. per number to 16's.

Skein yarn (mostly Southern):—

| | |
|---|---|
| 4's to 8's soft | 18-18½ |
| 10's to 12's | 18½-19 |
| 14's to 20's | 19½-21 |
| 22's | 21-21½ |
| 14/2 | 19½ |
| 16/2 | 20-20½ |
| 20/2 | 22-22½ |
| 30/2 | 25-26 |
| 40/2 | 29-30 |
| 16/3 slack | 19½-20 |
| 12/3 slack | 19 |
| 8/3 carpet | 18 |
| 8/3 slack | 18-18½ |
| 9/4 slack | 18-18½ |

Warps (mostly Southern):—

| | |
|---|---|
| 14's to 16's | 19½-20 |
| 20's to 22's | 21-22 |
| 26's | 23 |
| 14/2 | 20-20½ |
| 16/2 | 20½-21 |
| 20/2 | 22-23 |
| 24/2 | 23-24 |
| 30/2 | 25-26 |
| 40/2 | 28-29 |

Mixed colored yarns (mock twist, half colors):—

| | |
|---|---|
| 6's to 10's | 21-22 |
| 12's to 14's | 23-24 |
| 16's to 18's | 24-25 |

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

RICHARD A. BLYTHE,
Commission Merchant,
COTTON YARNS OF EVERY DESCRIPTION.
114 Chestnut St., Philadelphia.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted, Cable Cords and Twines.
PAWTUCKET, . . R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

# ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

## POCASSET WORSTED COMPANY,

# Worsted Yarns.

OFFICES:
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PROVIDENCE, R. I.

# CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

*Novelty Yarns*—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

*Genapped Yarns* of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

## B. F. BOYER CO.,

MANUFACTURERS OF

# WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

## RICHARD CAMPION,

Selling Agent for
BRISTOL WORSTED MILLS,
HIGHLAND WORSTED MILLS.

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ALL QUALITIES AND NUMBERS.
17 Bank Street,
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## YARNS Solis, Boston.

77
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## KEYSTONE SPINNING MILLS CO.,

Manufacturers of
**Woolen Carpet and Rug Yarns,**
Wool Scouring, Carbonizing, Garnetting,
1631 No. Second St. PHILADELPHIA, PA.

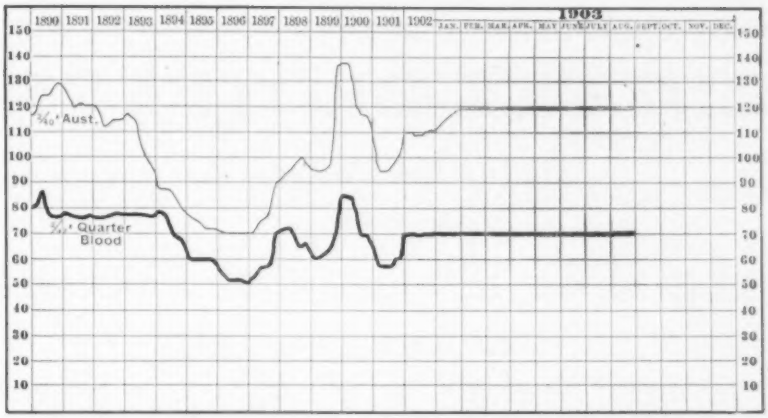



CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

## Worsted Yarn.

Spinners are trying hard for orders but without much success. Spinners' orders are running out and unless business greatly improves many spinning mills will be obliged to shut down. The situation is a curious one. Spinners cannot get orders and the wool merchant will make no concessions on the raw material, believing that the spinners are only "bluffing." The yarn question is not wholly one of price, for the time being. The styles call for goods made from woolen spun yarn which has displaced worsted yarn. Spinners say they can see no margin of profit, even at the prices being quoted, and while they are willing to make yarn at cost to keep their customers along, they do not care to push for orders which show a positive loss. There are mills, however, which are taking orders regardless of anything, to keep their help together and keep going.

Some spinners, after much deliberation, decide to take a prospective order at what they know to be a losing price. They approach the buyer with this low price and are informed that they will not buy at present; that they have yarn enough to last for two or three months, and when they do buy they expect to buy for less money. The spinner knows that a lower price on today's wool market is an impossibility.

Many of the weavers, to hold trade, are making

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

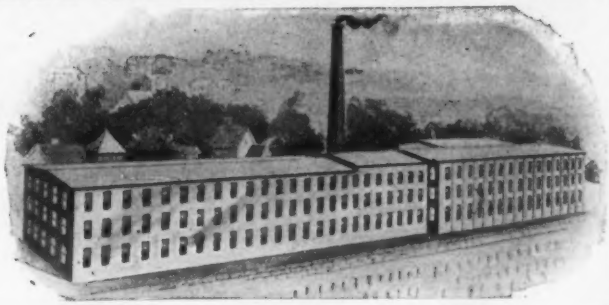
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

# CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

## Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

SALESROOMS:

477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut Street, PHILADELPHIA.
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239 Fifth Avenue, CHICAGO.

# WILLIAM RYLE & CO.,

Foreign and Domestic

## Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

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## E. C. HARPER,

WORSTED and WOOLEN YARNS,

MERCERIZED COTTON,

395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

## Speed & Stephenson,

WORSTED and WOOLEN

YARNS

A SPECIALTY.

ALSO TOPS.

170 SUMMER ST., BOSTON.

Long Distance Tel. 4168-2 Main.

**FIRE HOSE CORDS** From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.

**COTTON WARPS** On beams—single or ply yarns, grey, bleached or colored.

**GLAZED YARNS** All plys—any color—for braiders, harness and sewing threads.

**UNIVERSAL WIND** For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed. We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, SPRINGFIELD, MASS, MILL: CHATTAHOOCHEE, GA.

the same class and styles of cloth out of slightly lower grade of wool, and it would seem that this method may save some business. Weavers are getting business, and in fair amount, but the orders placed call for late delivery, not before October, November and December. The weavers are placed at a great disadvantage by this method as they fear to place orders for yarn because they think that later yarn will be lower. At the same time they know if the market works down in price these orders will be cancelled, and also that they will not have enough time to get the goods on the market promptly.

There is much complaint that even though the price of wool is higher and yarn is higher, there seems to be a "scramble" by certain mills to lower prices. This lowering of prices is more apparent than real, for the chances are that a change in material is responsible for the reduction. Some of the large weaving mills have shut down for a vacation, and it is believed this shut down has been to keep prices from going still lower and to protect the orders already secured. One large weaver of fancy worsteds called his help together and plainly stated to them that unless they accepted a 10 per cent. reduction the mills could not secure enough light weight orders to keep going, but that if they would work for 10 per cent. less wages the mill could be kept going at full time. The help accepted this proposition and the mill is now running full time.

Said a very large weaver of men's wear, who also spins his own yarn: "We cannot get orders to keep our piece dye worsted mill running. The price of 1/4 to 3/8 blood yarn is high, without much encouragement for lower prices, and consequently we cannot make concessions and cannot secure orders. On the other hand our woolen mill is so crowded with orders that we must run nights.

It is believed that later there will be a call for a better class of cloth, requiring a better quality of yarn, and also that there will be a greater demand for worsted yarn. This will be especially so if the wool dealer "sees new light" and is willing to make concessions which will enable the spinner also to make concessions. It is useless for spinners to talk advance to weavers. The weavers will not place orders because at present they can see no orders for immediate delivery for themselves, and consequently spinners are hampered for lower prices on "principal," and when orders are placed they are only for small amounts.

Last season there was business for a worsted and woolen thread twisted together; this season the demand is for a cotton and worsted thread twisted together. The dress goods end of the business is active

**JENCKES SPINNING CO.,**
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

LUZERNE COTTON YARN CO.,
MERCERIZED YARNS.
Mercerizers, Dyers, Bleachers and Coners,
WILKES-BARRE, PENNA.

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
PERCY H. de MAURIAC, Vice President.
OFFICES: 67 Chauncy St., Boston.
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108 Franklin St., N. Y. with James Talcott

Dixon's Flake Graphite adds to the lubricating power of any grease and any oil greatly out of proportion to the amount used. Actual test shows that one-seventh of the lubricating graphite added to the oil increases the lubricating power one-half. Ask for booklet 120-C.
JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

**Woolen and Merino YARNS**
**Eaton Rapids Woolen Mills,**
EATON RAPIDS, MICH.

**JOSEPH M. ADAMS CO.**
**WOOLEN YARNS,**
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

**Woolen and Merino Yarns,**
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

**Knitting and Weaving YARNS.**
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
223 and 225 Chestnut Street,
PHILADELPHIA, PA.

**SHODDY** WM. H. H. SLACK & BRO., Springfield, Vt.
Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.
RIVERDALE WOOLEN CO., MANUFACTURERS OF
**.. Shoddies ..**
Of every description. Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Speciality.
New York Office.
140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

but much of the demand is for woolen spun cloth with a small percentage of worsted yarn. Top makers are slow, and the bulk of the business is for a medium grade top. There are no concessions being made on fine tops as these tops are being sold at a price out of proportion to what fine wool can be purchased for at the present time. Coarse tops are selling but slowly and few are being made today, probably on account of the high price of combing wool.

The French spinners are getting some sample orders, but the bulk of this business will not be secured before October or November, as this is the earliest that manufacturers care to fill up for next year.

It is believed that the high cost of Egyptian yarn will cause many balbriggan manufacturers to run a worsted merino garment, as the cost of Egyptian is getting very near the cost of merino worsted, and knitters are going to use much of the French-spun merino yarn.

We quote:

| | |
|---|---|
| 2/40's Australian | 1.20 |
| 2/40's XX Delaine | 1.10 |
| 2/40's Half Blood | 1.05 |
| 2/20's Half Blood | .85 |
| 2/36's ¾ Blood | .75 |
| 2/26's ¼ Blood | .68 |

## Woolen Yarn.

Spinners continue busy for yarn for weaving and knitting purposes. The light weight orders are calling for much of this yarn in sizes running from 4 to 6 run, and is taking the place of worsted yarn in many instances.

The hosiery manufacturers are beginning to call for all wool yarn and merino yarn to take care of duplicate orders secured. The majority of the knitting mills running wool garments are busy. The stocks of all these mills are low and they are buying from hand to mouth. A few of the larger mills are well supplied with yarn and material, and should be making a fair profit, but the probabilities are that the trade is getting benefit of the manufacturers' foresight and the mill is rewarded by a good production.

Many of the mills that have made fleece-lined garments are closed on account of the high price of cotton yarn. Much thread waste is being used and the demand for this article is increasing. Noils are being used by underwear manufacturers today, and the consumption is greater than has been the case for years. Peruvian cotton is in good demand for yarn, but the shortage of this article is so great that, even at 20 cents, it is hard to secure a supply.

The spinners generally have all the orders that

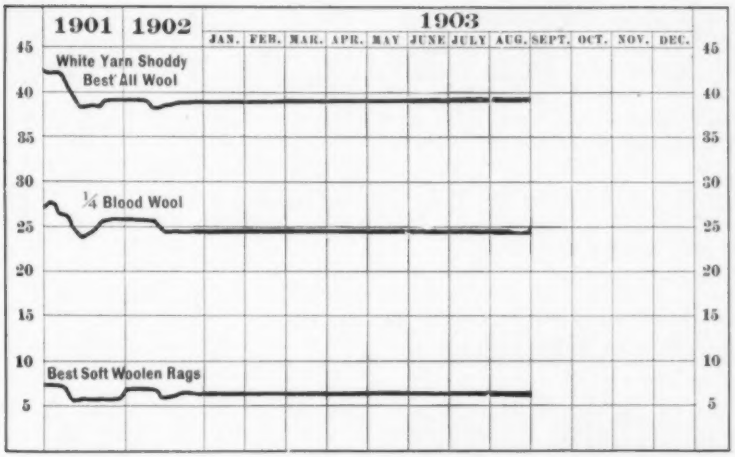


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

can be attended to, although we note some spinners are running a little short at the present time and later will need work.

The dress goods manufacturers are using much wool spun yarn and are buying considerable yarn outside.

The French flannel trade is slowing down. There is a great demand for wool out of which to make the cheviots now selling to such a great extent. A large quantity of B-super wool mixed with cotton, is being turned into yarn, and is slowly but surely glutting the market with this class of cloth; and that is why it is believed that later, a better class of cloth will be in demand.

The woolen mills have been getting large orders for cloth. The yarn used is made from almost a carpet stock with shoddy. There are but few picks in the cloth which is loosely woven, and the cloth will look well until wet. There is good money in this cloth at 82 cents, and the manufacturers could sell at 75 cents and make money.

The rubber boot lining trade is good at present and spinners are making much cheap yarn.

The fleece lining business is over until next year. The business for the balance of the year has not yet been developed; another month will prove whether the wool merchants or the manufacturers win. It is certain that it is impossible for manufacturers to secure advances. The buyer will not go beyond a given price and a decided advance stops business.

## The Rag and Shoddy Market.

Owing to the limited supply of rags the prices for both rags and shoddy are strong. The volume of business is limited owing to the light weight season when the consumption of wool substitutes is necessarily restricted. This feature is aggravated at the present time owing to the general curtailment of the production of light weights. Under these circumstances it speaks well for the market that prices have not receded. The rag, shoddy and waste dealers seldom experience duller business than has been the rule during the past month. One dealer stated that he had not booked an order in August up to the 22d of the month. His case is not an isolated one, and yet when a buyer goes around the market he finds few bargain lots, and is compelled to pay full prices or go without the material.

The demand for new clips continues active, and a fair business has been done in this line. The activity of the market is in spots and relieves but slightly the prevailing dullness, which is not likely to be replaced by pronounced activity until the manufacture of heavy weight goods causes a greater demand for short wool stock. We quote:

### SHODDIES AND EXTRACTS.

| | |
|---|---|
| White yarn, best all wool | 38-40 |
| White knit, all wool, best, fine | 28-32 |
| White knit, No. 2 | 23-25 |
| Light yarn, extra fine | 25-28 |
| New pure indigo blue | 23-25 |
| Fine worsted, new black | 26 |
| New blue clip, best, fine | 20-22 |
| Dark mixed yarn, extra fine | 22-24 |
| All wool yarn, medium and coarse grades | 15-20 |

*Merino.*

| | |
|---|---|
| Fine light, all wool, No. 1 | 24-25 |
| Medium light, all wool, No. 1 | 16½-17½ |
| Medium light, all wool, No. 2 | 14-16 |
| Fine black, all wool | 20-22 |
| Fine dark, all wool, best grade | 20-21 |
| Medium dark, all wool, No. 1 | 13-15 |
| Medium dark, all wool, No. 2 | 12-13 |
| Red knit stock, strictly all wool | 19-20 |
| Red flannel, all wool | 19-20 |
| Dark blue for hosiery, strictly all wool, No. 1 | 17-20 |
| Dark blue for hosiery, not all wool, No. 2 | 12-14 |

DELAINE EXTRACTS.

| | |
|---|---|
| Light | 19-22 |
| Medium light | 15-17 |

# Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

**CHAS. W. BECKER, Agt.,**
**Amsterdam, N. Y.**
**Address Dept. 7.**

## WILLIAM B. CHARLES,

# Cotton and Cotton Wastes

**Amsterdam, N. Y., U. S. A.**

## COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

## FRANK B. GRAVES,
DEALER IN
# Wool Waste

**COTTON SHODDIES,**
**GARNETTED STOCK, ETC.**
**68 Broadway, .. ALBANY, N. Y.**


| | |
|---|---|
| Regular gray | 12-13 |
| Black | 14-15 |
| Fancy colors | 16-20 |

**WOOLEN RAGS.**

| | |
|---|---|
| Fine merchant tailors, all colors | 9-11 |
| Choice light colors | 13-15 |
| Browns | 12-13 |
| Blacks | 9½-10½ |
| Fine blues, plain | 9-11 |
| Fine dark | 10-11 |
| Medium dark | 7-8 |

*Worsteds.*

| | |
|---|---|
| Blue | 16-18 |
| Black | 20-22 |

We quote as follows:

*Serges.*

| | |
|---|---|
| New black | 16-17 |
| New blue | 15-16 |

*Flannels.*

| | |
|---|---|
| New scarlet | 18½-22 |
| New blue | 17-18 |
| Cloakings | 3-4 |

SOFTS AND KNIT STOCK.

| | |
|---|---|
| Soft woolens, best | 7-7½ |
| Old white flannels | 14-16 |
| White flannels, No. 2 | 11-12 |
| Old red flannels | 9½-10 |
| Light blue flannels | 7½-9 |
| Old blue flannels | 6-7 |
| Old plaids | 5-7 |
| White stockings | 17-18 |
| White hood stock | 20-21 |
| Clear hoods | 9-10 |
| Red stockings | 9-10 |
| Blue stockings | 8-9 |
| Fancy stockings, No. 1 | 7-9 |
| Gray stockings | 9-10 |
| Black stockings | 9-10 |
| Knit stock comforters | 6-7½ |
| Red knit | 9-10 |
| Light gray knit | 9-10 |
| New light fancies | 16-18 |
| New fancies | 12-14 |

*Merinos.*

| | |
|---|---|
| Light, fine | 13½-15 |
| Light, coarse | 7½-8 |
| Fine, dark | 11-12½ |
| Dark, No. 2 | 5-6½ |
| Coarse dark | 4-4½ |
| Blue | 10½-11½ |
| Blue—seamed | 14-15 |
| Black—unseamed | 12-13 |
| New black | 18-20 |
| Small | 3¼-4 |
| Bunting | 6-8 |

**FLOCKS.**

| | |
|---|---|
| Shear, fine white, all wool | 9-11 |
| Fine indigo blue, all wool | 9-9½ |
| Fine black, and blue, all wool | 7-8 |
| Fine dark, all wool | 5-6 |
| Gig, fine, all wool | 3-4 |
| No. 1, black, all wool cut | 6-7 |
| All wool, fancy, shear and gig | 2½-3½ |

**COTTON WASTE.**

| | |
|---|---|
| No. 1 Spinners | 10½-11 |
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| No. 2 Machine | 5-5½ |
| Machine Cop | 6-6½ |
| No. 1 Cop | 7½-8 |
| No. 1 Card | 9½-10 |
| No. 2 Card | 8-9 |
| No. 1 Oily Card | 4½-5 |
| No. 2 Oily Card | 3½-4 |
| Egyptian Card | 10¼-10¾ |
| Peeler Combing | 11¼-11½ |
| Egyptian Combing | 11-11¼ |
| No. 1 Linters | 4-5 |
| No. 2 Linters | 3½-4 |
| White Clips | 6-6½ |
| Colored Clips | 3-4¾ |
| No. 1 Picker | 2½-3 |

**NOILS.**

| | |
|---|---|
| Australian | 48-50 |
| Fine domestic | 38-40 |
| ½ Blood | 24-28 |
| ⅜ Blood | 22-23 |
| ¼ Blood | 17-19 |
| Braid | 21-22 |
| Carpet (white) | 14-18 |
| Carpet (colored) | 10-12½ |

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| | |
|---|---|
| ½ Blood | 35-37 |
| ⅜ Blood | 27-30 |
| ¼ Blood | 23-26 |

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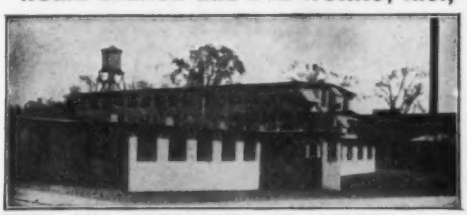

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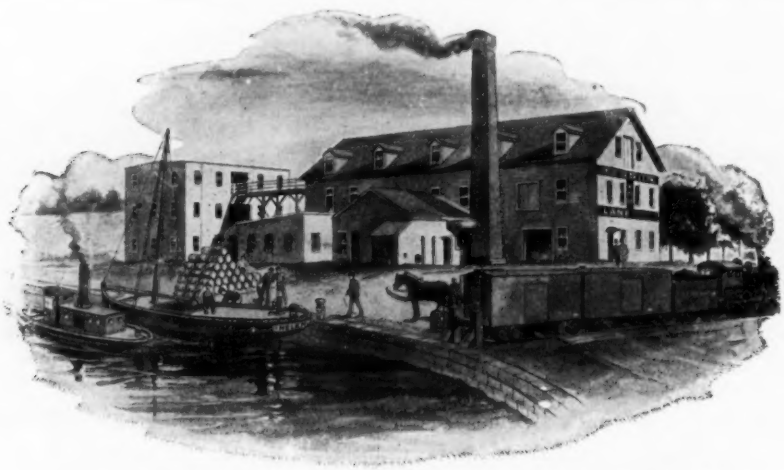

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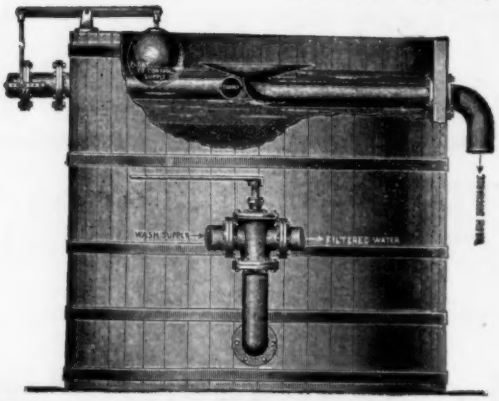

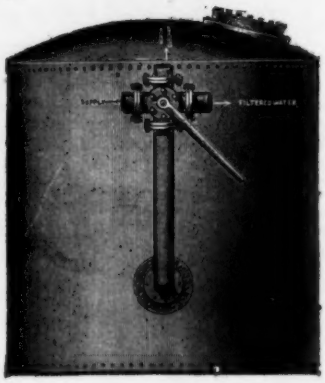

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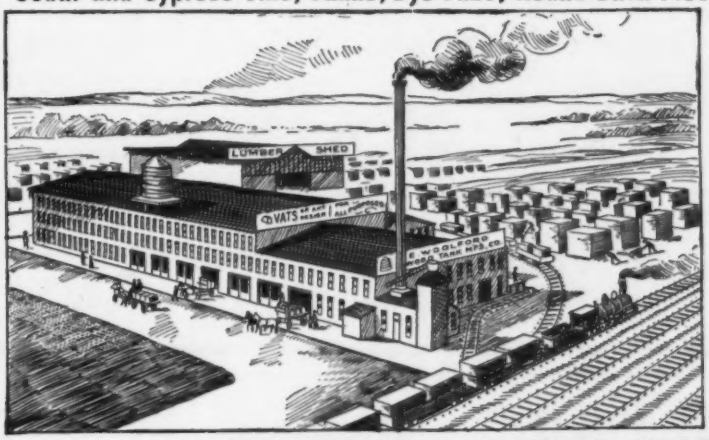


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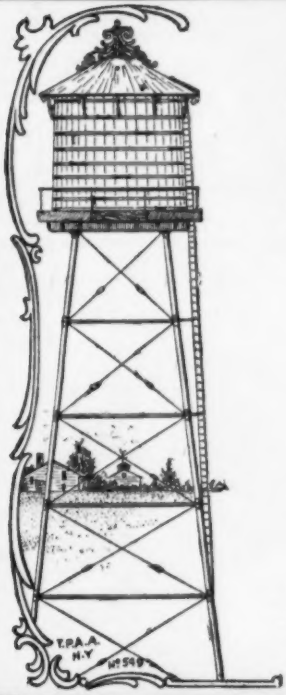

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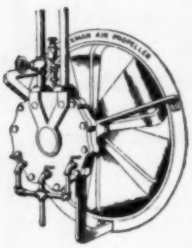

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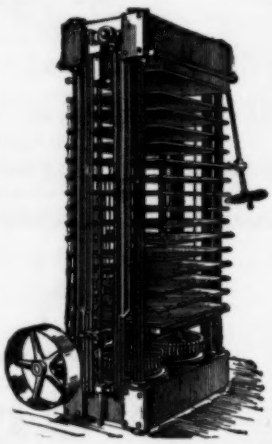

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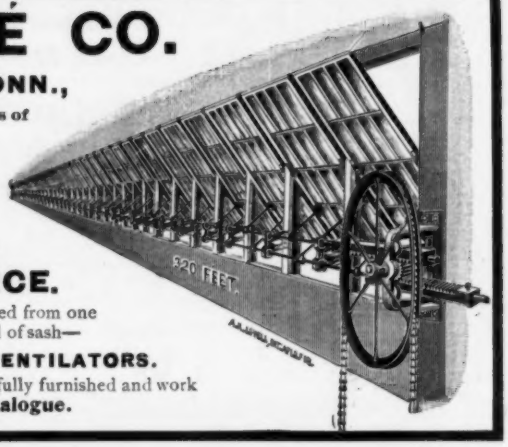

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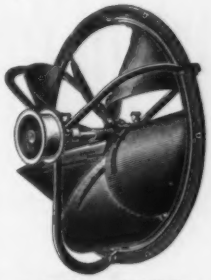

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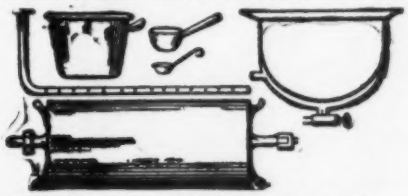

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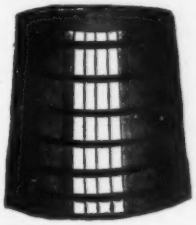


**TANKS**

**SOUTHERN**
**Apalachicola, Florida.**

Write Nearest

TRADE MARK INTERNATIONAL REGISTERED SPRINKLER CO.

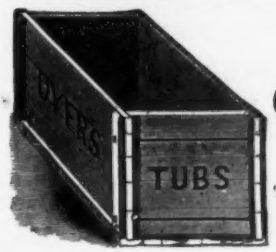
**Main Offices and Works**
**PHILADELPHIA, PA.**

New York Office
247 Water St.

Southern Office
Charlotte, N. C.

**Actively represented all over United States and Canada.**

Manufactures and installs sprinkler heads, dry valves and alarm valves. Universally approved by insurance interests. Write for full particulars.




Established 1868.

## AMOS H. HALL, SON & CO.,

Manufacturers of

# Cedar Vats and Tanks

**2915-2933 North Second Street,**

**PHILADELPHIA, PA.**

Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

**Down Town Office, 140 Chestnut Street, Corner Second.**

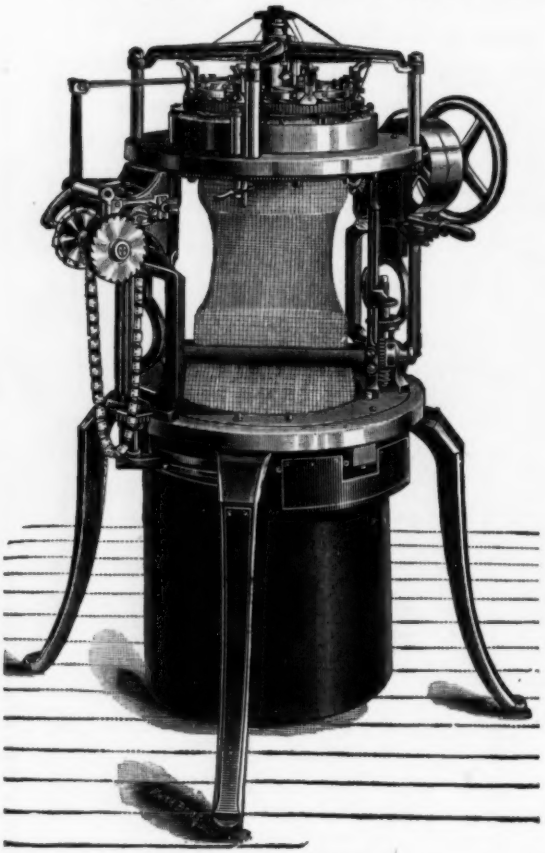
Hours from 12 to 1.

# McMICHAEL & WILDMAN MFG. CO.

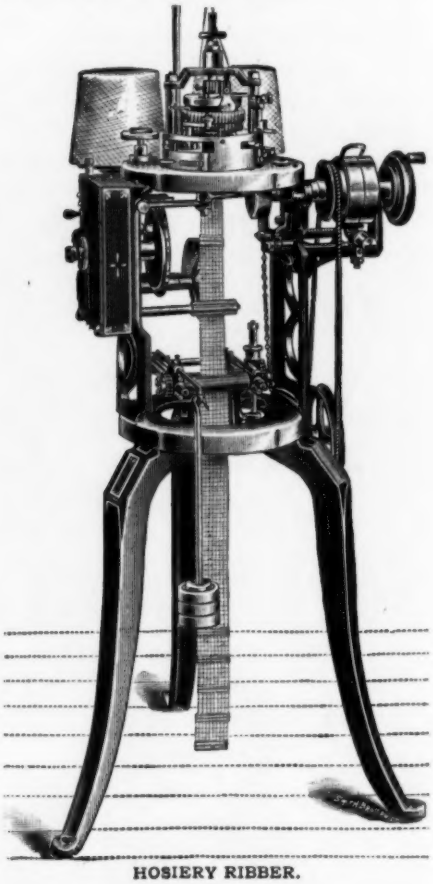
# CIRCULAR RIB KNITTING MACHINERY

**AUTOMATIC AND PLAIN**

**For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.**



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

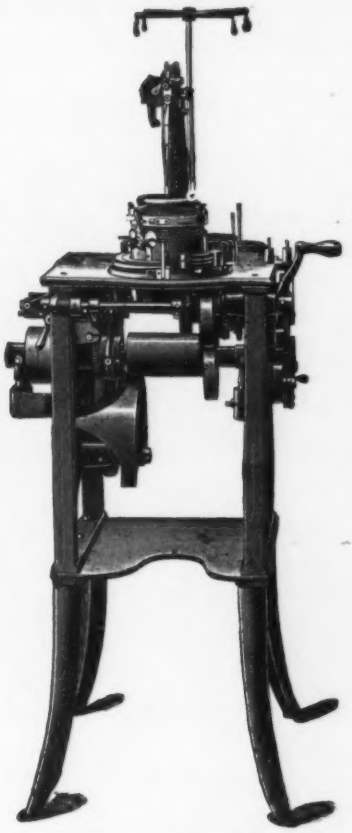
# McMICHAEL & WILDMAN MFG. CO.

**NORRISTOWN, PENN.**

# Acme Automatic Knitter

FOR SEAMLESS HOSIERY

ALL KINDS AND GAUGES



**Best method of transferring ribbed legs and tops.**

**Greatest production of perfect work at least cost.**

**All latest attachments and improvements.**

Our new type of machine, just out, having absolutely positive feed on pattern mechanism, which is set by dial, and graduated disc when changing styles and sizes, is one of the greatest improvements in knitting machines for a long time.

For particulars address

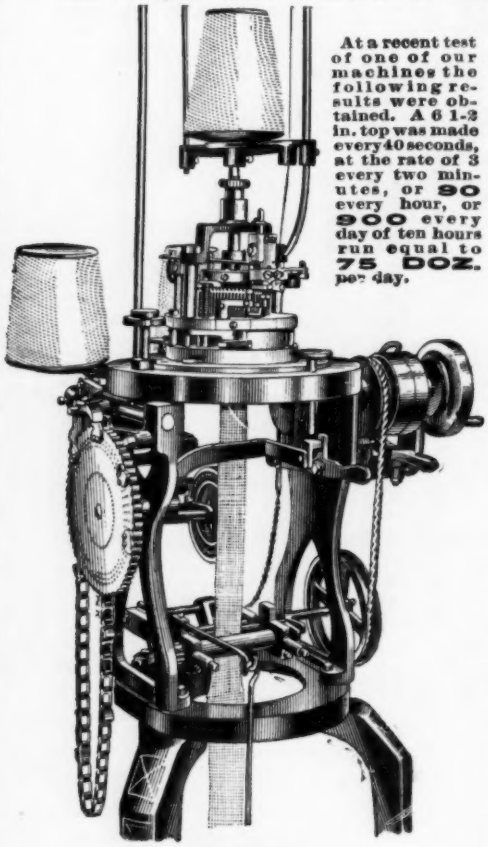
**MAYO KNITTING MACHINE & NEEDLE CO.,** FRANKLIN FALLS, N. H.

Philadelphia Office: Knickerbocker Building, Cor. 6th and Arch Sts.

**We manufacture all kinds of Latch Needles of superior quality.**

# RUTH COMPANY WINS PATENT SUIT.

**The United States District Court for the Eastern District of Pennsylvania has recently rendered a decision in the case of the McMichael & Wildman Mfg. Co. against the Ruth Automatic Knitting Machine Co., and decided that the new pin and slot connection, devised by Mr. George W. Ruth, Superintendent of the Ruth Co.'s factory, is not an infringement.**



**At a recent test of one of our machines the following results were obtained. A 6 1-2 in. top was made every 40 seconds, at the rate of 3 every two minutes, or 90 every hour, or 900 every day of ten hours run equal to 75 DOZ. per day.**

"We have just been granted the claims for the extreme OPEN WORK in LACE EFFECTS carrying over of more than one stitch, the original lace work was merely the carrying over of one stitch, which of course did not have much of an effect. The carrying over of two or more stitches is ORIGINAL with our Mr. Geo. W. Ruth in Rib Knit Goods. We have very BROAD CLAIMS covering this distinct feature and will use our best efforts to PROTECT users of RUTH machines from competition of others who may be trying to produce same work on machines of other makes."

Our machines are placed for trial under certain conditions, thus eliminating any risk that one might have to run were they to order a machine with no opportunity to test its worth.

Orders are now received for the new RUTH STOP MOTION and will be filled promptly, the trouble which has delayed delivery of this stop motion has been overcome.

The RUTH SPECIAL needles are being taken hold of by the trade and many favorable comments are being received for this, a recent product of the HOME OF IMPROVEMENTS IN KNITTING MACHINES.

PATENTEES AND MANUFACTURERS OF

**Ruth Ribber, Ruth Sleever, Ruth Splicer, Ruth Automatic Stop Motion, Ruth Lace Device, Ruth Friction Pulley, Ruth Belt Shift, Ruth Needles.**

## RUTH AUTOMATIC KNITTING MACHINE CO. Box T-W, YORK, PA.

We have a proposition for every manufacturer of Hosiery! Have you heard of it? Write at once.

# Friedberger Mfg. Co.

OUR 1904 LINE

**EDGINGS AND BRAIDS**

conceded by competent judges

# Head and Shoulders

above all previous efforts both in design and price : : : :

ALL GOODS SOLD DIRECT

**Mills at Germantown, Phila.**

P. O. ADDRESS, LOGAN STATION, PHILA.

# NYE & TREDICK COMPANY,

MANUFACTURERS OF

# Circular Rib Knitting Machinery,

## UNDERWEAR MACHINERY,

For Ladies' Vests, Combination Suits, Corset Covers, etc., Men's Underwear, Sweaters, etc.

**New Improved Sleeve Machines, Machines for Rib Hosiery, Rib Tops and Cuffs.**

LATEST IMPROVEMENTS ON ALL MACHINES.

**MECHANICAL STOP MOTIONS**

For Circular Rib Knitting Machines.

OFFICE AND SHOW ROOMS:

606 ARCH STREET, PHILADELPHIA.

# The "INVINCIBLE"

A machine of the highest grade.

Practical and Economical in operation.

A Big Producer.

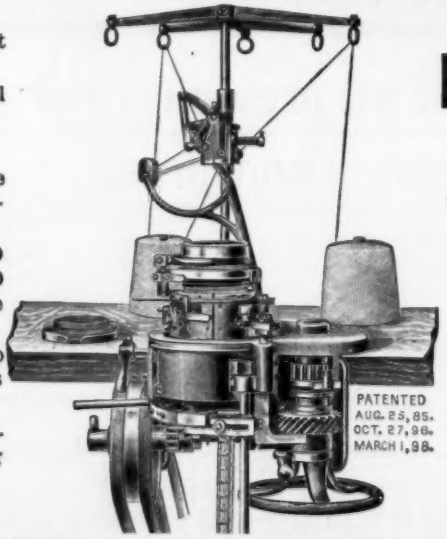
Gauge of machine changed by simple changing cylinders.

The Invincible METHOD OF TRANSFERRING RIBBED TOPS is quicker and more positive than others.

No experience required to transfer ribbed tops by this method.

YARN CHANGED automatically without revolving bobbins.

Write for Catalogue.




## Full Automatic Knitting Machine

For all kinds and gauges of

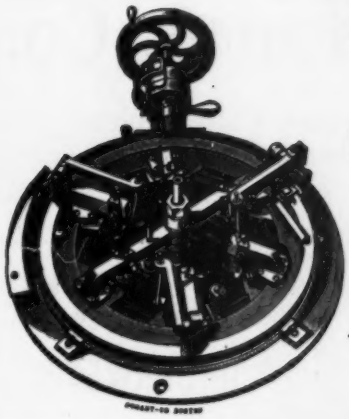
SEAMLESS HOSIERY

PAWTUCKET, R.I. U. S. A.

# E. JENCKES MFG. CO.

BRANCH OFFICE, Room 370, Bourse Bld'g, PHILADA, PA.

R. M. OATES, Selling Agt., HENDERSONVILLE, N. C.



# CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

**Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.**

**The Leighton Circular Machines** are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

**Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.**

**LEIGHTON MACHINE CO.,**
**Manchester, N. H.**

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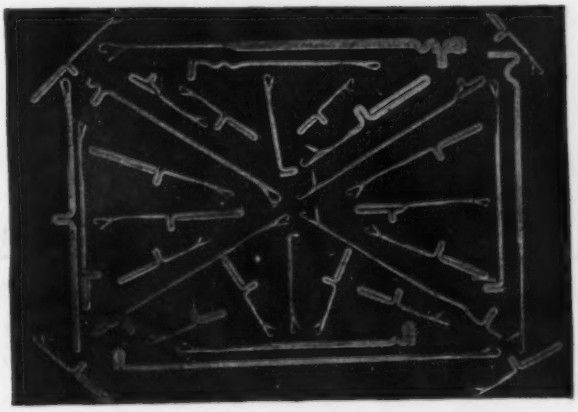
## Latch Needles

**For all Knitting Machines.**



## Our Superior or Sunken Rivet Head Needles

**Will save you money every day in the year.**

**Dodge Needle Co., Manchester, N.H.**

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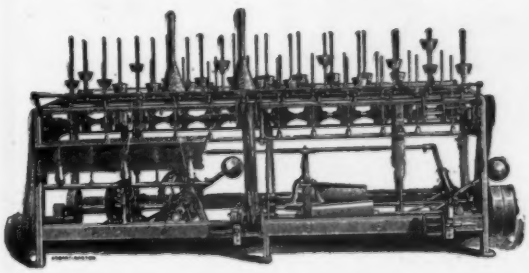
We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

# THE ABEL WINDERS



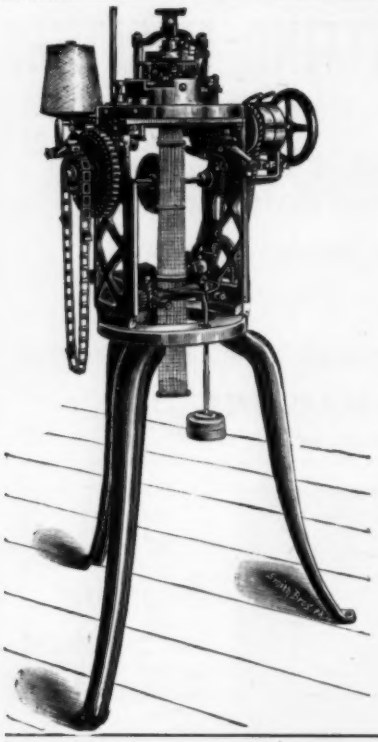
ALSO THE

## Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

**AUTOMATIC RIB KNITTING MACHINERY.**

**LEIGHTON MACHINE CO., Manchester, N. H.**



# H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

## Knitting Machinery

For HOSIERY and UNDERWEAR.

*Complete Estimates Furnished. Send for Particulars.*

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

## Adams Rib and Top Cutting Machine

**FULLY AUTOMATIC.**

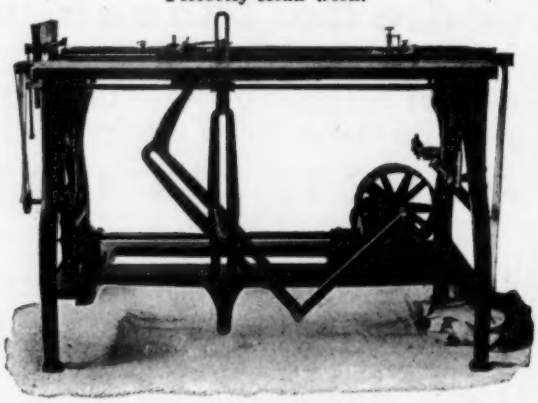
**Cuts all Fabrics with or without Welts. Requires no trimming after passing through machne. Perfectly clean work.**

Solidity.

Simplicity.

Absolute Positive Movements.

Best Materials.



Cutting and Working Parts Hardened Steel.

Easy Running.

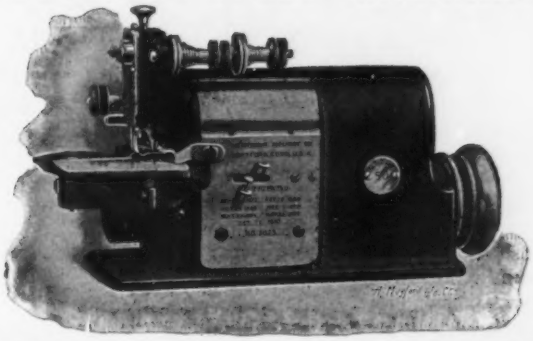
**False Welts cut out automatically. 1,500 dozen pairs, cut per day by one operator.**

Saving of Labor and Goods. Can be operated by boy or girl. Accidents impossible. No Special Attachments. Patented in the U. S. A. and Europe.

**Sole Manufacturers and Agents for the U. S. A.,**

**McMichael & Wildman Manufacturing Co., Norristown, Pa**

THE CHEAPEST and BEST METHOD
OF
# FINISHING RIBBED KNIT GOODS
IS BY THE USE OF
**OUR HIGH SPEED MACHINES.**



**BLANKETS, SKIRTS or COTTON GOODS,**
requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.
Send for Catalogue and Samples, stating the kind of goods to be finished.

**THE MERROW MACHINE CO.,**
346 Broadway, New York. HARTFORD, CONN. Bourse Bldg., Phila.

# Universal Cutter Co.
**4567-4569 SCOTT AVE., ST. LOUIS, MO.**

FRED BAUMANN, Jr., Eastern Mgr., 467 Broadway, NEW YORK.

# CUTTING MACHINES

Made to be operated by direct current, 110 or 220 volts.

What electric current have you?

*UNIVERSAL CUTTER will do the work BETTER and cut a GREATER quantity of Knit Underwear, or Fleeced Materials, than any other Cutting Machine on the market. : : : :*

Made in 3 sizes Circular Knives:—Gem, 3 1-4 inch Knife, weight 15 lbs.; Prima, 4 inch Knife, weight 24 lbs.; Giant, 5 1-2 inch Knife, weight 27 lbs. Two sizes straight or Reciprocating Knives. Send us sample of material you desire to cut, stating thickness you want to cut at one time, and we will advise you as to which size is best adapted to your wants.

# JAMES TAYLOR,

835 Arch Street, - - - - Philadelphia, Penn.

## KNITTING MACHINERY

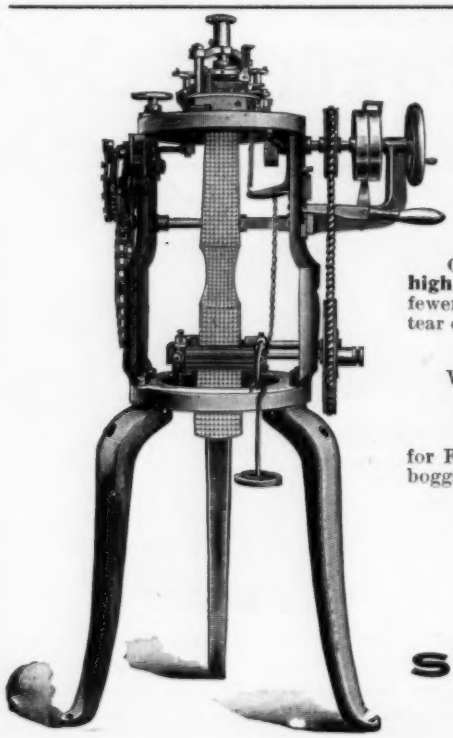
**OF ALL KINDS.** **NEW AND SECOND HAND.**

**A RARE OPPORTUNITY TO BUY.**

1 Hepworth 14 point straight looper.
1 Adams Rib top cutter.
25 Hepworth & Beattie loopers, 8 to 18 point.
1 Cornely hosiery embroidery machine.
5 Lamb knitters.
18 Ribbed underwear machines.
1 Standard buttonhole machine (new).
1 Hosiery press.
2 Skein winders.
8 New Backwinders.
1 Foot power lathe.
2 Merrow crochet machine.
140 welters and trimmers.
5 Union Special trimmers and 1 U. S. zig-zag overseamer.
75 Hosiery ribbers and sleevers.

**WRITE FOR COMPLETE LIST.**

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



# High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed,** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

**STRIPING AND DESIGNING MACHINES**

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

**Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.**

**STAFFORD & HOLT,**

LITTLE FALLS, N. Y.

# Hemphill Machine Co.

... BUILDERS OF ...

## FULL AUTOMATIC HOSIERY KNITTERS

FOR
**SEAMLESS HOSIERY.**

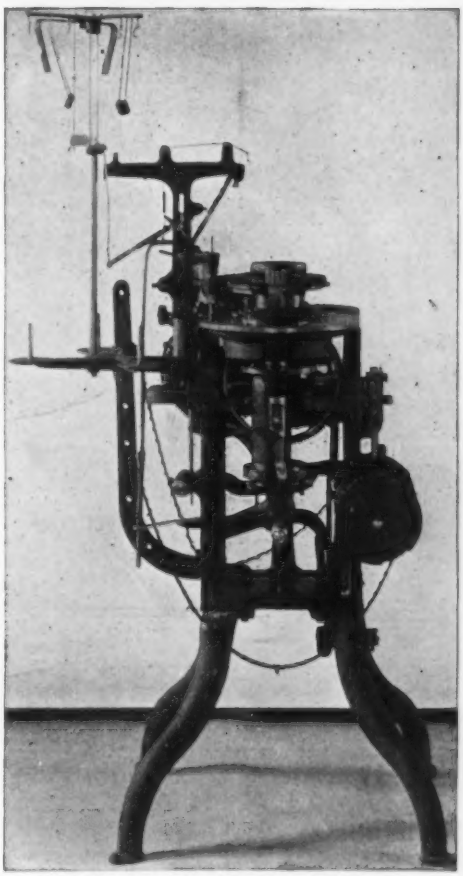
Superior to all because it has less parts.

Requires less repairs.

Easier to operate and

**Produces More Work**

with fewer seconds.



SIDE VIEW.

All Styles and Guages.

Yarn Changing Device for Heel and Toe.

Plaiting Device.

One needle pick for all operations.

Easy access to needles and sinkers.

Extra long bearing for cylinder, ensuring more even knitting.

**SIMPLE, SURE AND ECONOMICAL.**

These machines are on exhibition at the factory and references from several first-class manufacturers will be given on application.

Machines will be installed on approval for 30 or 60 days in any responsible concern.

**Fully Guaranteed.**

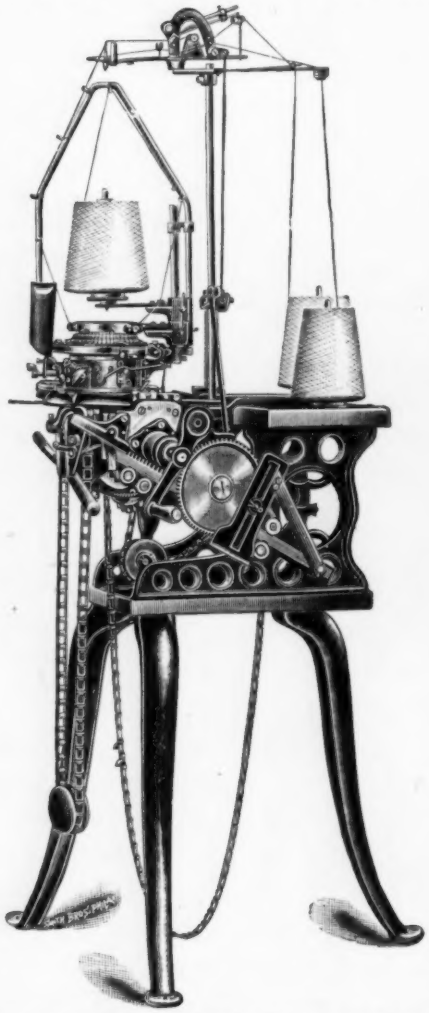
**PAWTUCKET, RHODE ISLAND.**

# EXCELSIOR

**Knitting Machine Mfg. Co.**

**BUILDERS OF**

## KNITTING MACHINERY



**Two-Feed 7-8 Automatic for Ladies String Work, also Black Legs with White Feet.**

**Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.**

**Allentown, Pa., U. S. A.**

## National Spring-Beard Needle MACHINE

**For Seamless Hosiery.**

The only Machine on which the speed is advertised.

**This Tells the Whole Story.**

Best results guaranteed at 300 to 400 revolutions per minute, according to guage, hence the largest production by 25 to 40 per cent. overall other machines. Least cost for repairs, smallest needle breakage and lowest per cent. of menders. Full automatic, practical double-sole and high-heel splicer. Device for producing a great variety of lace effects, with no breakage of stitches and no infringement.

For full particulars, call or address

**NATIONAL AUTOMATIC KNITTER CO.,**

**724, 726, 728 Cherry Street,**

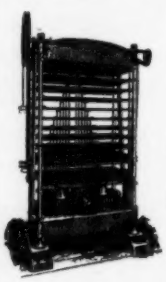
**PHILADELPHIA.**

## The CRAWFORD

HOLLOW STEAM

**PLATE PRESS**

**For Knit or Woolen Goods.**



The most reliable machine of the kind on the market.

***PRESS PAPERS and FENDERS.***

**SPENCE & RIDEOUT,**

Successors to
J. J. CRAWFORD & SON,

**NASHUA, N. H.**

Established 1868.

## PAXTON & O'NEILL'S

# 3-4 AUTOMATIC KNITTER

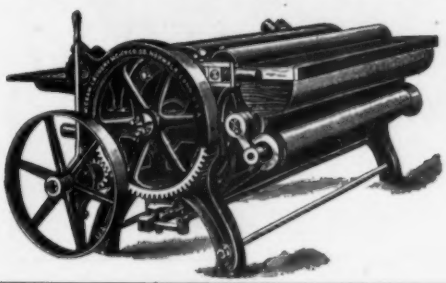
**FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.**

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

**Cylinders and Dials for all size Machines.** **127 Bread Street, Phila.**

## AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

**J. W. CRAW LAUNDRY MACHINERY CO.,**

**SOUTH NORWALK, CONN.**

## HEPWORTH & CO.'S

**Patent Single-Stitch**

# LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

**Single and Double Stitch, or Both Combined.**

**JOHN W. HEPWORTH & CO.,**

*N. W. Cor. Lehigh Ave. and Mascher Street,*

**PHILADELPHIA.**

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

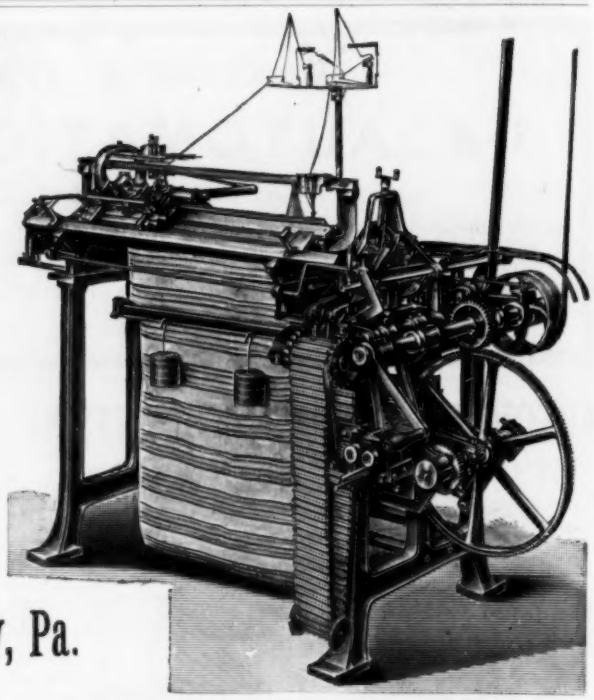
# German Knitting Machinery

**For Fancy and Full Fashioned Goods.**

Our Specialties are for Machines for Knitting **SWEATERS, GOLF JACKETS, FANCY VESTS, Etc.,** in **Plain, Honeycombed** and **Other Fancy Stitches.**

Our Steam Power Machines are fully Automatic. One operator attends four machines.

***Also Hand Power Machinery.***
***Also Underwear, Glove and Mitten Machinery.***



**E. H. LUDWIG, Hawley, Pa.**

**WOLFGANG RICHTER,**
Importer and Builder of
# Full Fashioned Knitting Machinery
**N. E. Corner Third and Green Streets,**
**PHILADELPHIA, PA.**

# IMPORTANT.

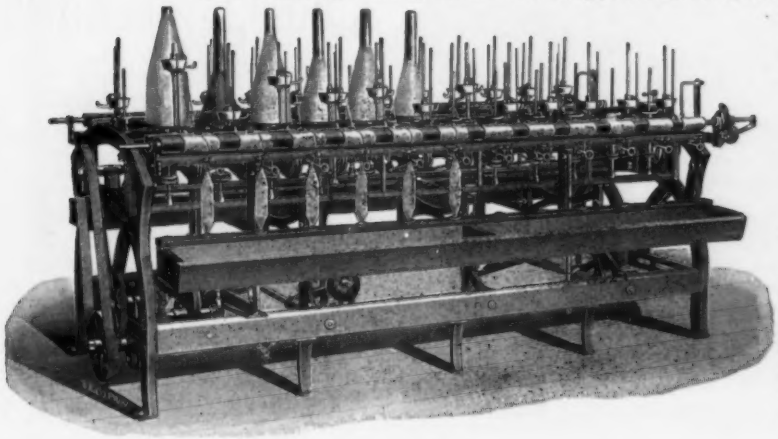
We have just issued our 1903 General Catalogue and 2 Special Catalogues, comprising all classes of . . . **Hosiery Machinery** They contain all information that can possibly be given and we ask all interested to apply to us. Will be sent post free on application to WILDT & CO., Leicester, England.

Agents for Bolton's Unshrinkable Process for which the sole right for U. S. A. is for disposal.

Has already been sold for Canada, Germany, England, Norway and Sweden, Denmark, Italy, Switzerland, Etc.

# OVER 1,400 PAYNE WINDERS IN USE

**For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.**



G. W. Payne. G. M. Fanning.

## GEO. W. PAYNE & CO

[Est. 1865, Payne & Mathewson.]

Builders of the

**Improved**

## Upright Spoolers,

**To Spool from Cop, Skein or Bobbin.**

**Doubling Spoolers, for doubling 2, 3, or more ends into one,**

**Upright Quilliers, Quill from Cop, Skein or Bobbin.**

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

**OFFICE, 102 BROAD STREET**
**Pawtucket, R. I.**

---

WILLIAM R. DILLMORE, President. JOHN C. EGLY, Secretary and Treasurer.

# KEYSTONE FULL AUTOMATIC KNITTER.

The simplest machine of the kind ever built. A small bench machine running with a 3-4 inch belt. Can be used with two cylinders, or transfer points if desired. Positive thread splice. All parts interchangeable. Call and see it in operation in our offices.

## MANUFACTURERS OF LATCH NEEDLES

We can furnish you needles for any make of machine that you use. We number among our customers, the best known mills in this country. We will be pleased to estimate on any line.

**KEYSTONE KNITTING MACHINE MFG. CO., 2600 North Sixth St., Philadelphia, Pa.**

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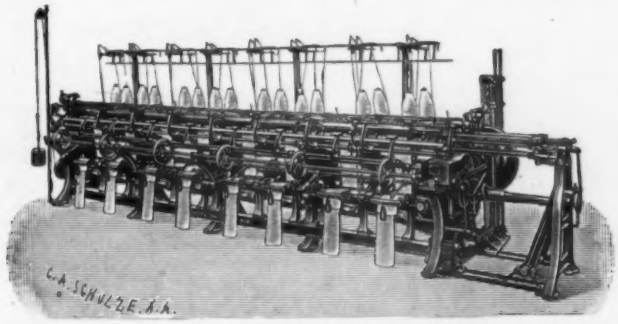
# SEYFERT & DONNER, CHEMNITZ, GERMANY.




**BUILDERS OF ALL KINDS OF**

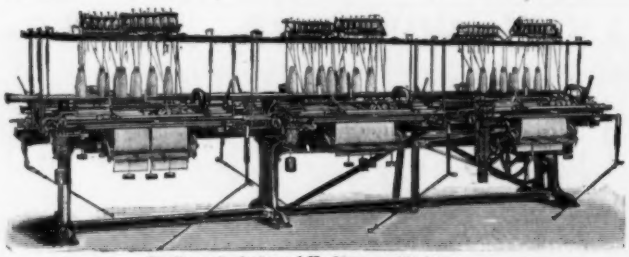
## Flat Knitting Machines

(LATCH NEEDLES)

This cut shows the **AUTOMATIC NARROWING MACHINE**, eight at once, for the manufacture of plain, seamless legs of Ladies' hose in endless bands with dividing thread. These legs, footed on the Circular machine, give the most perfect and cheapest full fashioned seamless hose that ever existed on the market.

N.B.—Narrowing Machines are built in various types for the manufacture of all kinds of underwear, garments, etc

**FULL AUTOMATIC POWER KNITTING MACHINES—Independent Heads.** Patentees and sole makers of the "**TEUTONIA**," best and quickest hand-knitting machine for hose and half hose. Griswold heel, narrowed toe.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

**Knitting Machines**

For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

**DOUBLE SYSTEM OF LOCKS.**

Double-side Power Stands, 6 at once.

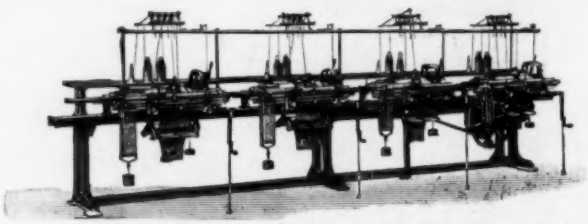
Paris, 1900, Gold Medal.

Ask for samples and particulars, state gauge and size you want.

**CLAES & FLENTJE,**

Mühlhausen, Thür,

GERMANY.



Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

**WILLIAM C. BULL,** BENNINGTON, VERMONT.

MAKER OF

For Ladies', Gents', and Children's Goods.

LATEST STYLES.

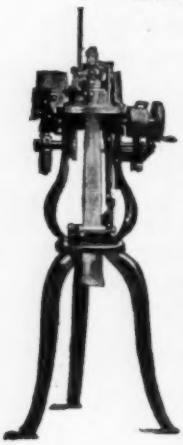
BEST WORKMANSHIP.

**Drying Form Boards**

OF EVERY VARIETY.

**Pepper Machine Works**

Lakeport, N. H.



Successors to Pepper Manufacturing Co.

Manufacturers of

**Knitting Machinery,**

INCLUDING

**Pepper's Flat Ribbed Cuff Machines,**

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

**Golf and Bicycle Stocking Machines,**

ALL KINDS OF

**CIRCULAR RIBBED MACHINES**

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

**Stanton & Lewis**

CENTRAL STEAM FORGE

316 and 318 Florist St.,

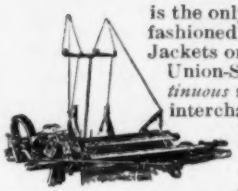
PHILADELPHIA .. .. . PENN.

The best equipped shop in the United States for the Manufacture of

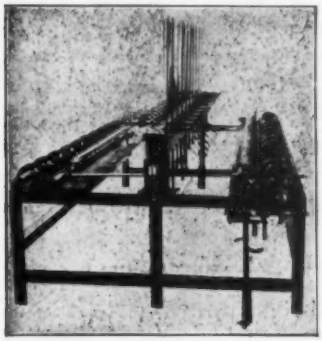
**Knitting Machine Cylinder**

and Sinker Bed Ring Forgings, from the smallest to 30 in. dia. of the best steel.

**The Grosser** PATENT FLAT KNITTING MACHINE



is the only reliable machine for full-fashioned Sweaters, Cardigan or Golf Jackets or Vests, Gloves, Underwear, Union-Suits, etc., that gives *continuous* satisfaction. All parts are interchangeable on our new style. The only automatic Machine for Jacquard Honey-Comb or Seamless Shaker Sweaters. We have the only first class High Speed 2 thread Lockstitch Overseamer for selvedged Knitgoods, that will sew in Sleeves or hem in double Bottoms on Sweaters without puckering. *ARTHUR MUELLER, 780 Madison St, Brooklyn, N. Y. Telephone 665a Bushwick.*



# Germantown Hosiery Machine Works

**Lindley's New Automatic Power Glove Fingering Machine, Cardigan Jacket and Circular Knitting Machines for Shirts and Hosiery.**

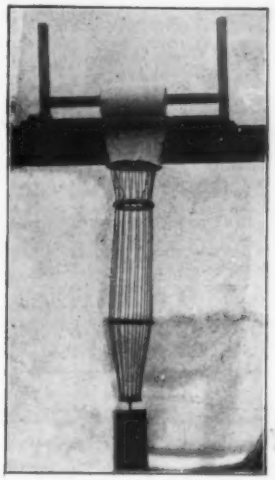
**Germantown Skein Winder and Links for Double Ribs**

Cylinders and Dials of all kinds made and hardened. Special Machine and Jobbing Work promptly attended to. Also equipped to do general repairing of Platt's Cotton Spinning Machinery. Correspondence solicited.

**GEO. W. LINDLEY, Prop.** 5120 Wakefield St. GERMANTOWN, PA.

# DRYERS

Now is the time to fit your Drying Rooms.



We offer the cheapest and best Dryer ever offered to the trade.

**Correspondence and Inspection Solicited.**

We are also manufacturers of:—

**Hydro-Extractor Guards,**
**Crimping Machines,**
**Neck Binders,**
**Table Legs, and**
**Gusset Cutting Machines.**

## Johnston Novelty & Mill Specialty Co.

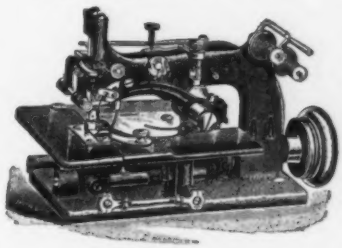
**No. 115 Genesee St., Utica, N. Y,**

H. C. LONG, New England Sales Agent, Hartford. Ct.

—THE—

# Champion Rib Knitting Machines

**For HOSIERY AND UNDERWEAR**



Also Sewing and Trimming Machines, Crochet and Shell Machines, and all other Machinery required in the finishing of Hosiery and Underwear. Complete Plants Installed.

**Estimates Cheerfully Given.**

Our New Overseaming Machine.

## CHAMPION MACHINE CO.,

**N. W. Cor. American and Diamond Sts.**

**PHILADELPHIA.**

**BANDS, BUTTON STAYS, FACINGS, ETC.**

—Can be made correctly only on the—

## Kennedy Universal Automatic Band Folding and Cutting Machine.

ACCURACY, SPEED, DURABILITY.

**KNITTING MILL SUPPLIES.**

**THOS. KENNEDY & SON, Cohoes, N. Y.**

## LEWIS JONES,

**60½ and Media Streets, . . . PHILADELPHIA.**

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

} EFFICIENT DURABLE LOW IN PRICE

# Perfect Fast Black for Hosiery

## The "Dubois' Sanitary" Oxidized Fast Black Dyeing Process with the Lisle Thread Silk Finish, Patented March 17, 1903, and The "Dubois Sanitary" One Dip Fast Black in Powder Form, Leads Them All!

This is the most reliable dyeing formula known to fast black dyers. It has been adopted successfully by many leading mills. It always gives uniform shade, oxidizes well and the fabric is almost as strong as though dyed with direct colors. Most important of all, it gives a fine lisle thread finish without in the least tendering the goods. Beware of cheap fast black formulas, which are sure to be dearer in the end.

The cost of the Dubois black, the best in the market, is very reasonable, as low as $1.40 per 100 pounds dyed in ordinary black for cheap trade, and not over $2.50 per 100 for the very best black for high grade goods, guaranteed to be ungreenable to acid tests and wear. Manufacturers of knit goods, hosiery and job dyers ***take notice*** that I am prepared to give licenses with full instructions for producing lisle thread finish (processes patented March, 1903) on any kind of direct colors or fast black, either before or after dyeing or bleaching.

Sulphur and diamine blacks particularly are so much improved after having been lisled by my patented process that they look just as well as aniline oxidized fast black, and yarn costing 17 1-2 cents per pound will produce as fine a looking fabric treated by my process as the genuine lisle thread at a cost of 34 cents per pound. This is a boon for direct color job dyers and bleachers, as well as for manufacturers of hosiery and knit goods.

The license will be given on a small royalty per 100 pounds.

All the machines used for the fast black and lisle thread finish, also for giving lisle thread finish to direct colors on bleached or unbleached goods are of my own invention, and are

**PATENTED AS FOLLOWS:**

June 18, 1901. Rotary oxidizing apparatus. The only machine in the world that carries the goods while oxidizing and lisling at all points of the compass. Quickest oxidizer known.

September 9, 1902. Rotary yarn oxidizing apparatus. Also carries the yarn at all points of the compass while in process of oxidizing or steaming.

June 10, 1902. A stationary hosiery oxidizing apparatus. Two different speeds. Especially constructed for lisle thread finish on hosiery or knit goods, equipped with an electric thermometer for the accurate measurement of the dry and wet hot air.

December 10, 1900. Stationary hosiery oxidizing apparatus. Two speeds. Chain and sprocket wheel drive with double clutch to start and stop. Very strong for heavy work, also built for lisle thread finish,

**ALSO NOTICE:—That My One Dip Sanitary Fast Black in Powder Form** is the same black as the Sanitary Oxidize Fast Black Process mentioned at the head of this advertisement, and is a long felt want among the trade, particularly for small concerns whose production would not warrant the equipping of an Oxidize Fast Black Dyeing plant.

This One Dip Sanitary Fast Black is dyed in the open ordinary dye tub at boiling heat in one hour, then washed and softened, if desired, as is done with all other direct colors for cotton hosiery, and has the advantage on the other direct blacks to allow the production of any shade desired from a jet to a very blue black, and matching well the oxidized aniline black.

The cost per 100 pounds hosiery dyed with this black is from $3.50 to $3.80 according to amount of softener used.

This One Dip Sanitary Black is positively guaranteed to be ungreenable to acid test and wear and leave the fabrics as strong after dyeing as it was in the white.

The apparatus required to start dyeing are but two ordinary wood dyer's tubs and one hydro-extractor.

Those wishing to put on their goods so dyed my "Lisle Thread Finish" (Patented) can do so by simply adding to above apparatus one or more of my "Stationary Oxidizing Machines" (Patented June 10, 1902), and take out a license for the use of my patent for lisle thread finish on vegetable fabrics, which will be given free of charge, and all you will have to pay for the use of the machine and the lisle thread finish process, will be but a small royalty for each 100 pounds hosiery given the lisle thread finish.

Dyers and manufacturers that are far away may procure a license with full instructions for building the machines economically, paying a small royalty for the use. I have made the royalties low, so that ***no one may be debarred by reason of the price,*** but I mean to protect my patents and will vigorously prosecute any who infringe.

Fast black dye and bleach plants for hosiery, underwear and skein fast black yarn dyeing, installed and equipped complete, if desired. Apply to

**A. N. DUBOIS,** 2170 Sedgeley Ave., Phila., Pa.

or

**KEYSTONE LAW and PATENT CO.,** Betz Bldg., So. Broad and Market Sts., Phila., Pa.

HANDY.

NON-SPILLABLE.

THE subject of BELT DRESSING is not too trivial for the Buyer who wishes to run his mill to its full capacity for the least expense.

Time of idle hands is money.

Spoiled product is money lost.

In buying Stephenson Belt Dressing you are insured against further shut-downs to take up slack belts.

Its many good qualities can only be appreciated by its use.

May we have your next **trial** order, or shall we send you you a free sample by mail?

*STEPHENSON MFG. CO., - Albany, N. Y.*

**L. T. IVES CO.**

Manufacturers of all kinds of

**SPRING KNITTING NEEDLES**

NEW BRUNSWICK, N. J.

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**PAGE NEEDLE CO.,**

MANUFACTURERS OF

**LATCH NEEDLES**

of all kinds. Warranted in every respect.

CHICOPEE FALLS, MASS.

Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 835 Arch Street, Philadelphia, Pa.

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**W.M. BREEDON'S SON,**

MANUFACTURERS OF

**Spring Knitting Needles**

*AND BURR BLADES OF ALL KINDS.*

AMSTERDAM, - N. Y.

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**ORION TREAT,**

MANUFACTURER OF

**Screw Riveted Balmoral and Double Rib NEEDLES**

(Patented May 6, 1890.)

*All Work Guaranteed.* MANCHESTER GREEN, CONN.

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**WM. COREY CO.,**

Manufacturers of Knitting Machine

**Latch Needles,**

MANCHESTER, N. H.

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**EXCELSIOR NEEDLES.**

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

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**Manufacturers' Supplies Co.**

418 ARCH STREET, PHILA.

**Needles and Supplies for Knitting Mills.**

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

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**FREEMAN BROS.**

Manufacturers of

**Latch Needles**

Harmony Block, BRATTLEBORO, VT.

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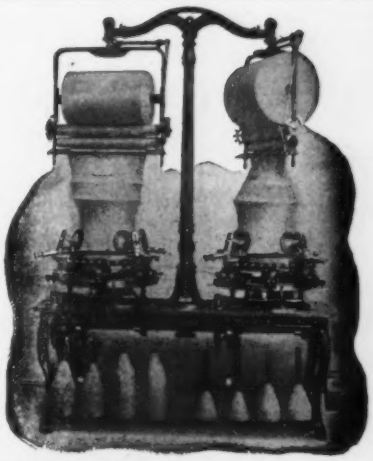

TOMPKINS BROS. Troy, N. Y.

Knitters, Winders, Burrs, Attachments.

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**The New "Victor" KNITTING MACHINE.**

A full automatic seamless machine, thoroughly interchangeable in all its parts. More simply constructed than any other.

Also full automatic **Two-color Striping Machine** and full automatic combination lace and stripe machine.

**AMERICAN KNITTING MACHINE CO.,**

Office and Shop, Woonsocket, R. I.

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**Beatties'**

**PATENT LOOPERS**

**Wm. Beattie & Son,**

COHOES, N.Y.

An Illustrated Catalogue will be sent on application.

TRADE MARK.

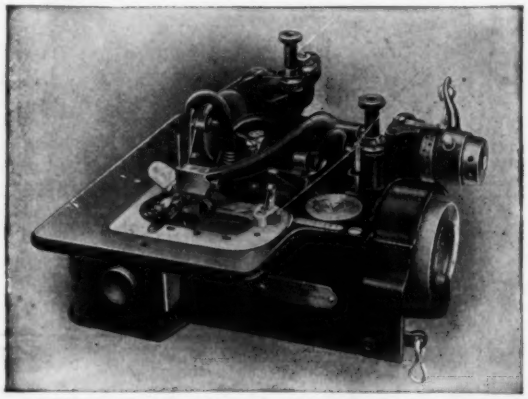
Business Est. in 1859

## WILLCOX & GIBBS

# "OVERLOCK" Machine.

(TRADE MARK.) (Pat. April 5, 1892.)

Patent twice upheld by the U. S. Court of Appeals.



**For Trimming, Seaming (or Hemming, or Overedging) and Covering Raw Edges in One Operation of Knit Underwear and Hosiery; and for making Overlock Corded Edge on Woven Fabrics.**

## WARNING!

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by our four patents of April 5, 1892, and one of May 26, 1896, but the edging products are also protected by patents of March 10, 1896, and Dec. 26, 1899.

## WILLCOX & GIBBS SEWING MACHINE CO.,

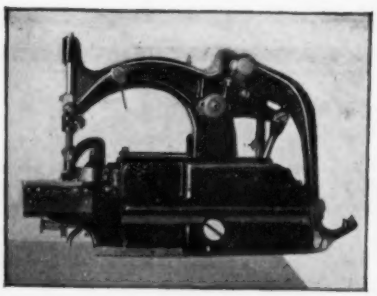
General Offices:

Nos. 85-87-89 Bleecker Street, near Broadway, NEW YORK, N. Y.

Also, LONDON.—PARIS.—DRESDEN.—MILAN.

# The Arnold Sewing Machine Co.

216 High Street, NEWARK, New Jersey.



**Overedge Welting Machine,** *with Trimmer.*

The very best in the market. (No royalty.)

**Overedge Seaming Machine,** *with Trimmer.*

3000 stitches per minute. (No royalty.)

**Overedge Sewing Machine,** *without Trimmer.*

For manufacturers of knit goods and other fabrics, with or without trimmers.

**Our claims are Simplicity, Durability, Accessibility,**

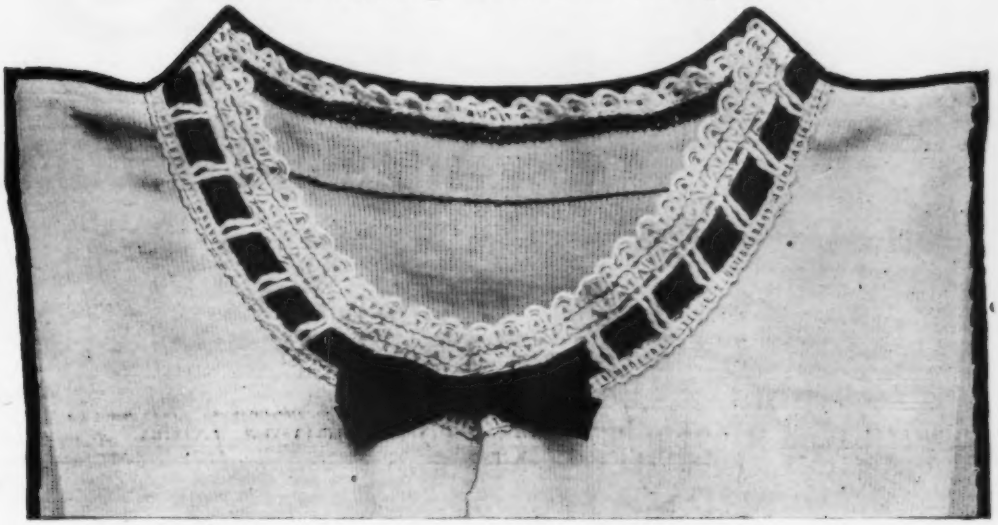
***EVERY PART OF OUR MACHINE BEING READILY ACCESSIBLE.***

This machine has 100 less parts than any other overedge machine.

# Do you use this Collarette Finish?

*Union Special Machine Style 12700*

Stitches lace on opposite sides of ribbon and covers raw edge of web in one operation.



This is the only machine that will stitch the lace to the garment and position the cross bars of the lace. If you are not satisfied with your present methods and want to reduce cost, and at same time improve quality, write us for samples and information.

## Union Special Sewing Machine Co.

CHICAGO. NEW YORK. PHILADELPHIA. BOSTON. AMSTERDAM, N. Y. COHOES, N. Y. ST. LOUIS. CINCINNATI.

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## WILFRED WELLS,

Sole Manufacturer of the

## CHAMPION HOSIERY STAMP.

PATENTED JANUARY 7, 1896.

The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.

505 W. Lehigh Avenue, . . . PHILADELPHIA, PA.

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## LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

## CELEBRATED BRAND PYRAMID LACINGS

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

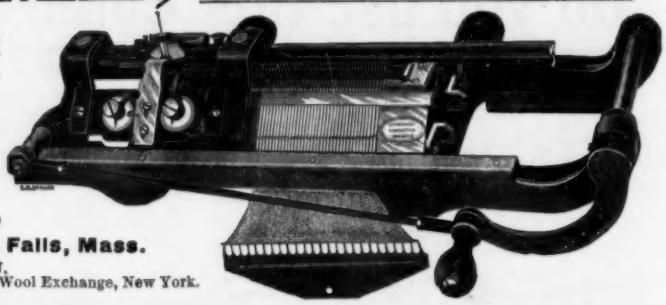
115 Franklin Street, NEW YORK.

# The LAMB, LEADER OF KNITTERS,

**Original and Still the Best.**

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



**LAMB KNITTING MACHINE COMPANY,**

**P. O. Box 5888, Chicopee Falls, Mass.**

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

# THE BEST

## Full-Fashioned Hosiery Machines

Simplicity, durability, large production, fine work are the characteristics of the machines for knitting fashioned hosiery made by the

**CHEMNITZER**

**WIRKWAAREN - MASCHINENFABRIK**

(Formerly Schubert & Salzer)

**CHEMNITZ, GERMANY.**

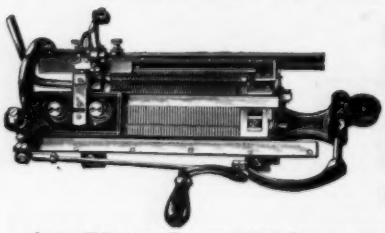
Representative for the United States,

**OTTO WALTHER, 591 Bourse Building, Philadelphia.**

# Best Knitting Machines

**IMPROVED CONSTRUCTION**

**For Hand and Power Driving.**



**High Speed, Excellent Workmanship.**

**Auto. Rib-top, Fancy-stitch Jacquard Machines.**

Everywhere in work. **80,000** Machines sold.

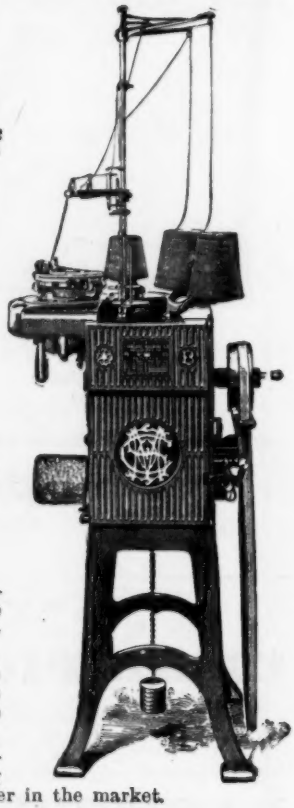
**CLAES & FLENTJE,**

**Muhlhausen, Thür, Germany.**

# Standard Machine

**Superior to All Others in Economy of Operation, Production and Fabric.**

**Best Built, Easiest Operated, Superior Fabric.**



STANDARD B, Automatic Double Sole and all Improvements.

STANDARD C, the only Automatic Heel and Toe Changer.

STANDARD D, Automatic Striping Machine, none other in the market.

# STANDARD MACHINE CO.

**508 Ludlow St., PHILADELPHIA, PA.**

**Estimates Furnished for Complete Hosiery Plant.**

# CHARLES COOPER,

BENNINGTON, VERMONT.

MANUFACTURER OF

# Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines,** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

## COLLARETTE ATTACHMENT

**Branch Shop, Amsterdam, N. Y.**
**Philadelphia Office, "The Bourse."**
**European Office, 68 Deansgate Arcade, Manchester, England.**

**C. J. SIBBALD, General Representative, 160 Sixth Ave., Upper Troy, N. Y. Telephone No. 4325.**
**G. E. PARKER, Traveling Representative, Amsterdam, N.Y.**

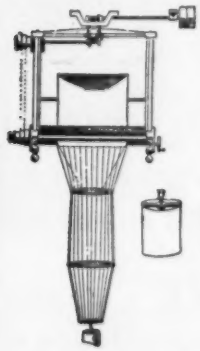
## CRANE MFG. CO. Lakeport, N. H.

**Spring Needle Circular**

## KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
**A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.**

## Drying Machines



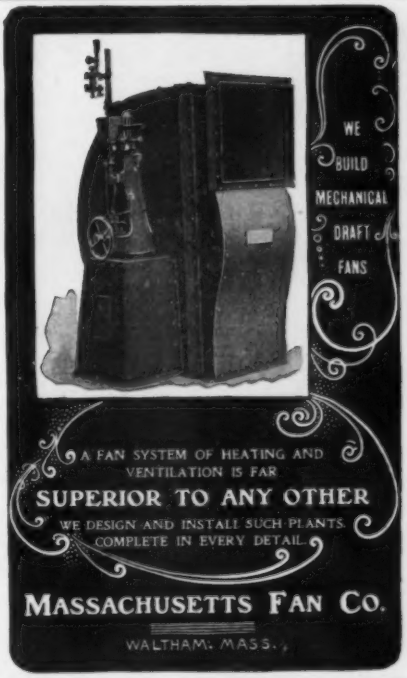
**Acknowledged** by **Drying Machine Manufacturers** that the Johnston Patent Vertical Dryer Spreader has not its equal in this country. No complaints ever received. Do not buy until you know what it will do.

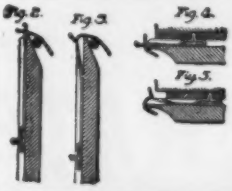
**Made and Sold only by**

**E. M. Antisdel,**

**Utica, N. Y.**

**Send for Circulars and Prices.**


WE BUILD MECHANICAL DRAFT FANS
A FAN SYSTEM OF HEATING AND VENTILATION IS FAR
SUPERIOR TO ANY OTHER
WE DESIGN AND INSTALL SUCH PLANTS COMPLETE IN EVERY DETAIL
MASSACHUSETTS FAN CO.
WALTHAM, MASS.




## A NEW AND VALUABLE IMPROVEMENT

**On Rib Frame Cylinders and Dial.**

Saves Mending and also Breaking of Needles.

For Information Address

**John Adams, 2416 Hazzard St., PHILADELPHIA.**

## JEFFREY ELEVATING-CONVEYING MACHINERY.

SEND FOR CATALOGUE.

THE JEFFREY MFG. CO. Columbus, O.

## A. McMICHAEL,

## *Machinist,*

**Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.**

## FINE MACHINE WORK.

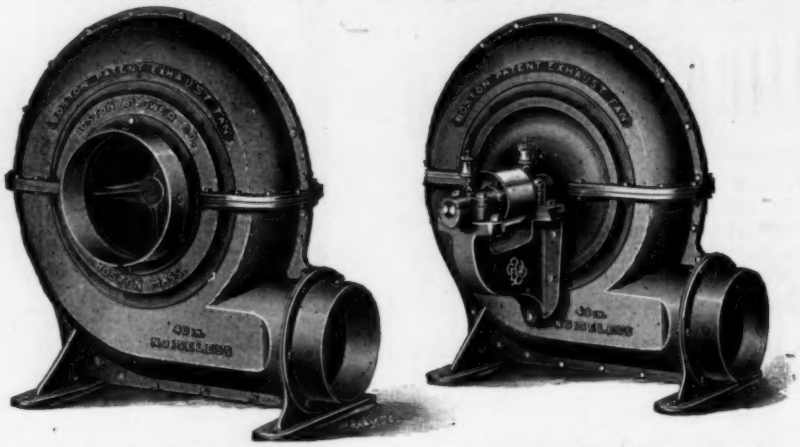
**22 Armat Street, near Main, Germantown,**

**PHILADELPHIA, PA**

**We HARDEN all CYLINDERS and DIALS large and small.**

# Boston Wool Exhausters, with Removable Tops.

**As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.**



**Inlet Side of Right-hand Wool Exhauster.** **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

**BOSTON BLOWER CO.,** Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**

# WATER WHEELS

**FOR ALL HEADS FROM 3 FEET TO 2000 FEET.**

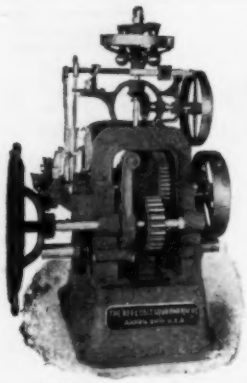
Adapted to all **POWER** Purposes. Easy working balanced gates. We guarantee greatest power with smallest quantity of water, at both full and part gates.

***State Head and Power Required.***

## AUTOMATIC ENGINES

**10** to **50** H.P., guaranteeing best possible regulation with highest economy in steam. Pamphlet of either Wheel or Engine sent on application.

**JAMES LEFFEL & CO., Springfield, Ohio, U. S. A.**



# WATERWHEEL GOVERNORS

**FOR TEXTILE MILLS Electric Light, Power and Railroad Work**

We are now prepared to **guarantee absolute satisfaction.** Write for references in your locatity.

## THE REPLOGLE GOVERNOR WORKS

**Broadway and Chestnut Streets, AKRON, OHIO.**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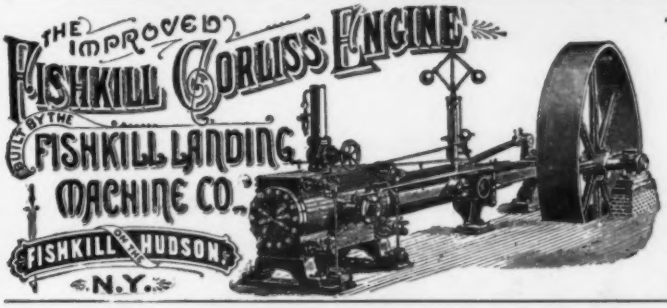
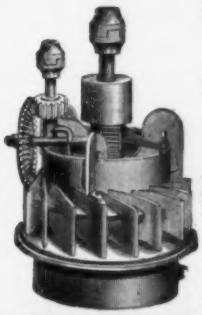



The Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



**TURBINES** ON HORIZONTAL AND VERTICAL SHAFTS.

These wheels are specially designed and adapted to **TEXTILE MILLS**

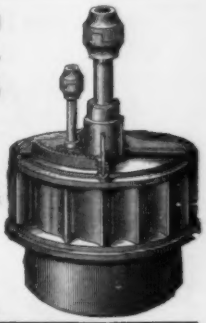
The records of the Risdon Wheel are not equaled by the records of any other wheel. Average of results of tests in Holyoke Flume: Full Gate, .8694; Seven-eight, .8472; Three-quarter, 8014; Five-eighth, .7601.

**RISDON CELEBRTAED TURBINES. ALCOTT HIGH DUTY TURBINE. Unequalled Efficiency. Easy Working Gate. Greatest Power from a Limited Quantity of Water at Smallest Cost.**

**TAYLOR SLEEVE GATE TURBINE. The largest power ever obtained from a Wheel of the same diameter.**

SEND FOR CATALOGUE.

RISDON-ALCOTT TURBINE CO. Mount Holly, New Jersey, U.S.A.



**PAIR McCORMICK TURBINES**

4,000 H.P., 85 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

*Write for Catalogue if contemplating purchase of turbines.*

**S. MORGAN SMITH CO.**
**YORK, PA.**
**Boston Office, 176 Federal Street.**

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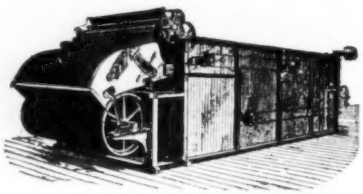
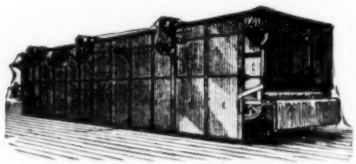


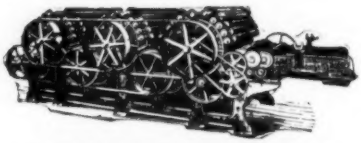
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

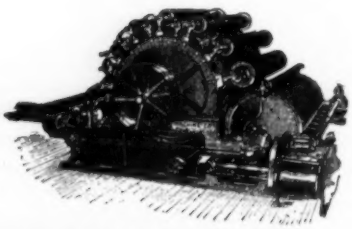
# "CYCLONE" DRYERS

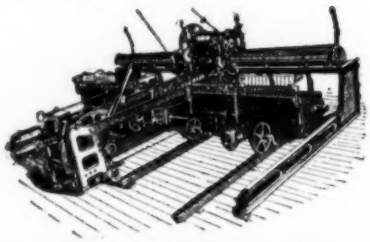
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



# "PROCTOR"
# Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





# "FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

# The Textile-Finishing Machinery Co.

**17 EXCHANGE PLACE, PROVIDENCE, R. I.**

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

**BUILDERS OF ALL KINDS OF**

# MACHINERY

**FOR**

# BLEACHING

# DYEING

# DRYING

**AND**

# FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

**Estimates, drawings and full particulars of complete plants furnished on application**

SEE INSIDE FRONT COVER PAGE

## JAMES SMITH WOOLEN MACHINERY CO.

**411 to 421 Race Street, Philadelphia.**

# Woolen Machinery

FOR

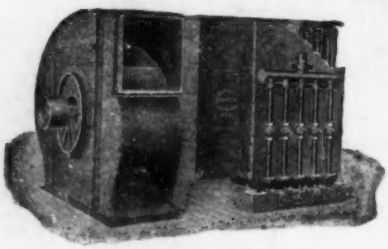
**Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.**

Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.

## BUFFALO Fan System

**of Heating—Ventilating—Drying and Humidity Control**



Economical—Efficient—Reliable

*Used by America's Foremost Textile Mills.* *Send for List.*

Buffalo Forge Company

BUFFALO, N. Y.

## NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

**The only perfect system of winding yarn for knitting purposes.**

***Over 30,000 spindles in use in the U. S.***

**FOSTER MACHINE CO.,**

**Westfield, Mass.**

## Walworth Manufacturing Co.,

**HIGH PRESSURE**

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"Walmanco" Pipe Flanges,

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